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SPECIFICATION

FOR

THE GENERAL CONSTRUCTION

EXCLUSIVE OF
HEATING APPARATUS, ELEVATORS, ELECTRIC
WIRING, AND CONDUIT SYSTEMS

OR

TWO LABORATORY BUILDINGS

FOR THE

U. S. DEPARTMENT OF AGRICULTURE,

WASHINGTON, D. C.

JAMES WILSON, Secretary of Agriculture.

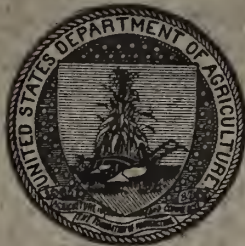
BUILDING COMMITTEE.

B. T. GALLOWAY, Chairman,

D. E. SALMON,

A. C. TRUE,

JOHN STEPHEN SEWELL.



RANKIN, KELLOGG & CRANE, Architects,
1012 WALNUT STREET.
PHILADELPHIA.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1904.

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OFFICE OF THE BUILDING COMMITTEE,
U. S. DEPARTMENT OF AGRICULTURE,
Washington, D. C., September 19, 1904.

Sealed proposals will be received at this office until 2 o'clock p. m. on the tenth day of November, 1904, and then opened, for the general construction (except heating apparatus, elevators, electric wiring, and conduit systems) of two laboratory buildings for the U. S. Department of Agriculture, Washington, D. C., in strict accordance with the drawings and specifications, by Rankin, Kellogg & Crane, Architects, 1012 Walnut street, Philadelphia, Pa., copies of which may be had upon application to the Supervising Engineer, Capt. John Stephen Sewell, Corps of Engineers, U. S. Army, at the Department of Agriculture, Washington, D. C.

One set only of drawings and specifications will be sent to any one bidder, but additional sets may be purchased of the printers designated by the Department, at cost of production of same.

All applications must be accompanied by a certified check for \$250, made payable to the Disbursing Clerk of the Department of Agriculture, which checks will be retained until the return of all drawings and specifications, including those which may have been purchased from printers.

B. T. GALLOWAY,
Chairman.

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[Office of Rankin, Kellogg & Crane, Architects, 1012 Walnut street, Philadelphia.]

SPECIFICATION

FOR

The General Construction (except Heating Apparatus, Elevators, Electric Wiring, and Conduits) of two Laboratory Buildings, designated as Laboratory A and Laboratory B, for the U. S. Department of Agriculture, Washington, D. C.

ACTS OF CONGRESS.

The work called for under these specifications is authorized by the following legislation:

AN ACT for the erection of a building for the use and accommodation for the Department of Agriculture.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Agriculture be, and he is hereby, authorized and directed to cause a suitable and commodious fireproof building, for the use and accommodation of the Department of Agriculture, including all of its Bureaus and offices now occupying rented quarters in the District of Columbia, to be erected on such portion of the grounds of the Department of Agriculture belonging to the United States as he may deem expedient, immediately in the vicinity of the present building, said building to be constructed in accordance with plans, to be procured, based on accurate estimates, providing for the erection of said building, complete in all of its details, as herein described, and within a total cost of not exceeding the sum herein stipulated, and he is hereby authorized, after procuring such plans, and after due advertisement for proposals, to enter into contracts within the limit of cost hereby fixed and subject to appropriations to be made by Congress, for the erection of said building complete, including heating and ventilating apparatus, elevators, and approaches, and the removal of the present building or buildings of the Department of Agriculture on said grounds.

SEC. 2. That the supervision of the construction of said building shall be placed in charge of an officer of the Government especially qualified for the duty, to be appointed by the Secretary of Agriculture, subject to the approval of the head of the Department in which such officer is employed, who shall receive for his additional services an increase of twenty-five per centum of his present salary, such increase to be paid out of the appropriation for the building herein authorized.

SEC. 3. That the limit of cost for the construction of said building complete, including heating and ventilating apparatus, elevators, and approaches, and the cost for removal of the present building or buildings of the Department of Agriculture, is hereby fixed at one million five hundred thousand dollars, and no contract shall be entered into or expenditure authorized in excess of said amount.

Approved, February 9, 1903.

[From the sundry civil act approved March 3, 1903.]

DEPARTMENT OF AGRICULTURE.

To commence the erection of a new building for the Department of Agriculture, authorized by the Act approved February ninth, nineteen hundred and three, two hundred and fifty thousand dollars, of which sum one hundred thousand dollars shall be immediately available; and the Secretary of Agriculture is hereby authorized to enter into a contract or contracts for the completion of said building within the limit of cost of one million five hundred thousand dollars fixed by said Act.

GENERAL CONDITIONS.

Form of Proposal and Signature.

1. Proposal must be made on the blank form hereto attached, plainly marked "Proposal" on the envelope or cover, with title of buildings as given above and addressed to the Chairman of Building Committee, Department of Agriculture, Washington, D. C., stating in writing and figures (without interlineation, alteration, or erasure) the sum of money for which the bidder proposes to supply the materials and perform the work required by the drawings and this specification, and the time within which he proposes to complete the work, and the unit prices called for in proposal sheet. The proposal must be signed with the full name and address of the bidder; if a copartnership, the copartnership name by a member of the firm, with the names and addresses in full of each member; and if a corporation, by an officer in the corporate name, with the corporate seal attached to such signature. No telegraphic proposals or telegraphic modifications of proposals will be considered. Proposals received after the time advertised for the opening will be returned unopened. If proposal is sent by registered mail, allowance should be made for the additional time required for such transmission.

Certified Check.

2. Each bidder must submit with his proposal a certified check, in a sum equal to 2 per cent of the amount of such proposal, drawn to the order of the Disbursing Clerk of the Department of Agriculture, and the proceeds of said check shall become the property of the United States, if, for any reason whatever, the bidder, after the opening of the bids, withdraws from the competition, or refuses to execute the contract and bond required in the event of said contract being awarded to him, and checks submitted by the unsuccessful bidders or the amount thereof will be returned after the approval of the contract and bond executed by the successful bidder.

Subcontractors.

3. No subcontractor or other person furnishing material or labor to the contractor will be recognized, nor will the United States be responsible in any way for the claims of such persons beyond taking a bond, with good and sufficient sureties, with the additional obligation that the general contractor shall make prompt payment to all persons furnishing him labor or materials used in the prosecution of the work. Persons so furnishing materials or labor to have a right of action on said bond, in the name of the United States for their use.

4. Neither the whole nor any portion of the work herein described shall be sublet without the written approval of the supervising engineer first being obtained, but such approval shall in no way relieve the contractor of responsibility.

5. Bidders will note that the name of proposed subcontractors for certain work requiring special skill must be mentioned in proposals. The reputation, experience, and the reliability of the parties whose names are submitted will be given due consideration by the representatives of the Government, and the right is expressly reserved to reject a proposal if the subcontractors for any cause shall be considered unsatisfactory. When a proposal has been accepted, it will be an obligation of the contract that the work of the branches referred to shall be done by the parties approved.

Rights Reserved.

6. The material proposed to be used, time for completion of work, and the competency and responsibility of bidders will receive consideration before award of contract.

7. The Department reserves the right to accept any part or parts of the proposal made at the prices included in same; also to waive any informalities in, and to reject any and all proposals.

Form of Contract.

8. The contract which the bidder agrees to enter into shall be in form based upon the terms of this specification.

Insurance.

9. The contractor must obtain, at his expense, all necessary policies of insurance on work and material supplied by him, as the same will be at his risk until final completion, inspection, and acceptance; but the contractor will be relieved of any risk for such portions of the buildings as may be occupied by the United States before entire completion of his contract.

Modifications.

10. The Department reserves the right to make any additions to, omissions from or changes in the work or material called for by the drawings and specification, without notice to the surety or sureties on the bond given to secure satisfactory compliance with the terms of the contract; and the United States further reserves the right to demand additional security when additions are made, if, in the judgment of the duly authorized representative of the United States, such security is required. The unit prices called for in the proposal sheet shall be used as the basis of value of such additions, omissions, or changes, if they are deemed reasonable by the supervising engineer. If deemed unreasonable or if none applicable are given, and

no agreement can be reached by the supervising engineer and the contractor as to the reasonable value of the work, then the supervising engineer, representing the United States, shall have the right to fix the value of such additions, omissions, or changes, and no claim for damages on account of such changes or for anticipated profits shall be allowed.

Delays.

11. Each bidder must submit his proposal with the distinct understanding that, in case of its acceptance, time for the completion of the work shall be considered as of the essence of the contract, and that for the cost of all extra inspection and for all amounts paid for rents, salaries, and other expenses entailed upon the United States by delay in completing the contract, the United States shall be entitled to the fixed sum of \$200 as liquidated damages, computed, estimated, and agreed upon, for each and every day's delay not caused by the United States. *Provided*, That the collection of said sum may, in the discretion of the Secretary of Agriculture, be waived in whole or in part, and that the contractor shall be entitled to one day, in addition to said stipulated time, for each day's delay that may be caused by the United States, or may be due to causes which could not have been foreseen or prevented by the contractor. *Provided further, however*, That no claim for time allowance by reason of any of the above causes shall be valid unless the contractor shall present to the supervising engineer written notice thereof within forty-eight hours of the occurrence of any such delay. All questions as to the existence, cause, or duration of delays shall be decided and finally determined by the supervising engineer.

12. It is understood and agreed that the supervising engineer, acting for the United States, shall have the right to suspend any portion of the work embraced in the contract, whenever, in his opinion, it would be inexpedient to carry on said work.

Notice to Sureties.

13. The final inspection and acceptance of the work shown by the drawings and specification, forming a part of the contract, shall not be binding or conclusive upon the United States if it shall subsequently appear that the contractor has willfully or fraudulently, or through collusion with any representative or official of the United States on the work, supplied inferior materials or workmanship, or has departed from the terms of his contract. In any such case the United States shall have the right, notwithstanding such final acceptance and payment, to cause the work to be properly performed and satisfactory material supplied to such extent as in the opinion of the supervising engineer may be necessary to finish the work in

accordance with the drawings and specification therefor at the cost and expense of the contractor and the sureties on his bond, and shall have the right to recover against the contractor and his sureties, the cost of such work, together with such other damages as the United States may suffer because of the default of the contractor in the premises, the same as though such acceptance and final payment had not been made.

Payments.

14. Payments of 85 per cent of the value of the work executed and satisfactorily in place, based upon the estimated value thereof as ascertained by the supervising engineer, will be made every thirty or sixty days, or as may be provided in the contract, and the payment of the 15 per cent retained will be made after the final approval and acceptance by proper representatives of the Department of all work and materials embraced in the contract; but no payment shall be due until every part of the work to the point of advancement reached (for which payment is claimed) shall be satisfactorily supplied and executed in every particular, and all defects therein remedied to the satisfaction of the supervising engineer; nor shall any payment be due until satisfactory samples and shop drawings, as required by the specification, shall have been submitted. To aid the supervising engineer in ascertaining the value of work done and in place, the contractor shall furnish to the supervising engineer, before any payment shall be due, a schedule of prices upon which the contract is based. No payment shall be made on account of this contract except upon the written order or certificate of the supervising engineer, which certificate must also be signed by the architects as a certification that any work affecting the artistic value of the buildings has been satisfactorily performed.

Scope of Specification.

15. This specification is intended to embrace the entire structures complete and ready for use, excepting only those items the omission of which is specifically noted; and all and each portion of the work, whether included in this contract or done as extra work, shall be governed by the terms of this specification.

Discrepancies.

16. The drawings are to be taken together with the specification and not separately, and should there exist any discrepancy between them, the contractor shall apply to the supervising engineer for further and particular instructions for each case, and, failing to do so, shall make the work right at his own expense to the satisfaction of the supervising engineer.

Supervision.

17. Every part of the work is to be executed under the direction, to the entire satisfaction, and subject to the approval and acceptance of the supervising engineer and the architects, as hereinafter set forth in detail, and under the supervision and direction of such agent or agents as may be appointed by the Secretary of Agriculture.

Power of Rejection.

18. The said supervising engineer or other duly authorized representatives of the Department of Agriculture shall have full power at any time to reject any materials which he may deem unsuitable, or not in strict conformity with the letter or spirit of this specification; he shall also have power to cause any work to be taken down and altered at the cost of the contractor, which in his opinion is inferior, unsuitable, or unsafe; but the responsibility for all unsafe work, scaffolding, rigging, centers, etc., shall rest upon the contractor in all cases.

19. It is understood that the inspection and acceptance of materials and workmanship at the mills, shops, etc., to facilitate the progress of the work, shall not preclude rejection at the building if the same shall be found unsuitable.

Interpretation.

20. All questions relating to the intent or meaning of the plans, drawings, specification, or of the quality or kind of materials or work required thereby, shall be decided by the supervising engineer as provided in paragraphs 40-42. In case of dispute as to questions affecting the artistic value of the work, the matter shall be referred to the architects and their decision shall be final, conclusive, and binding upon the parties; questions affecting only the stability, durability, fireproof qualities, etc., shall be finally decided by the supervising engineer.

Disputes.

21. Any disagreement or difference between the United States and the contractor upon any question arising as to the quality of work or material furnished shall be decided by the supervising engineer, and his decision shall be final, binding, and conclusive upon the parties. *Provided, however,* That if the matter shall affect the artistic value of the work, the final decision shall rest with the architects.

Quality of Work and Material.

22. All material used throughout to be the best of its respective kind, and shall be new, unless otherwise specifically mentioned herein. This specification is intended to provide for and describe a

high order of material and workmanship, and is required to be in keeping with the importance and prominence of the buildings. Contractors in bidding on the work must take this into consideration, and will note that drawings and specifications will receive literal interpretation, and the work severe inspection.

23. The entire work provided for in this specification and the drawings is to be constructed and finished in every part in a good, substantial, and workmanlike manner, according to the full intent and meaning of the same, and should any item be omitted in the drawings and herein specified, or vice versa, it is to be understood as expressed in both, and shall be carried out as if so expressed, to correspond in all respects with the remainder of the work.

Foreman, etc.

24. The work shall at all times be conducted in charge of competent superintendents, foreman, and subforeman, the chief of whom shall represent the contractor and have general authority to act for him, and the contractor shall discharge and not reemploy upon this work any foreman, or any and all workmen whom the supervising engineer may deem incompetent or careless. The contractor shall also give his personal attention to the work.

Details.

25. Detail drawings subsequently furnished will be based upon the requirements of the drawings and specification and are to be considered as explanatory of the same. The contractor in preparing estimate must take into account and make allowance for reasonable variation in the development of full-size-details from the smaller scale drawings.

Copies of Drawings.

26. The contractor, upon application at the office of the supervising engineer, will be furnished with a reasonable number of the contract drawings and specification, two copies of each of the scale details subsequently made, and one copy of each of the full-size details. Should he desire additional copies of the detail drawings or cloth-mounted prints of any drawings, they will be supplied to him at his expense.

Proposals.

27. Proposals must be made on the blank form hereto attached, for labor and materials required for the construction (except heating apparatus, elevators, electric wiring and conduits) of two laboratory buildings, designated as Laboratory A and Laboratory B, for the United States Department of Agriculture, upon the south side of the "Mall" between Twelfth and Fourteenth streets, Washington, D. C.,

in strict accordance with drawings Nos. 274-33 to 274-39 and 274-43 to 274-76, inclusive; this specification, the models, and such other details as may from time to time be prepared by the architects and furnished to the contractor through the supervising engineer.

Unit Prices.

28. Each bidder must state the unit prices called for on the blank form of proposal; said prices, if deemed reasonable by the supervising engineer, will be used as a basis in fixing the valuation of changes that may be required in the work as hereinbefore provided. Bids naming unreasonable unit prices or failing to name the unit prices called for may be rejected.

Instructions to Bidders.

29. Before submitting a proposal, each bidder shall examine all the drawings and the entire specification, including proposal sheets, to inform himself fully as to the material and character of workmanship required, and he should also visit the premises to observe the conditions of the site. After the execution of the contract, no consideration will be granted for any misunderstanding of the work to be done, it being understood that the tender of a bid carries with it an agreement to this and all other conditions herein mentioned and implies a full understanding of the specification and plans.

Alternates.

30. Alternate proposals are required as called for in proposal sheets, and it must be understood that all materials and workmanship required thereby shall be of the best, must in all cases correspond with similar work herein specified, and, if accepted, the work must be done under the general terms of the specification. Failure to give the alternate proposals required may cause the rejection of a proposal.

Verbal Replies to Inquiries.

31. Neither the United States, the supervising engineer, nor the architects will be responsible in any way for verbal answers to any inquiries regarding the meaning of drawings or this specification, or for any verbal instructions by themselves, their employees, or others in advance of the award of the contract.

32. Any explanations which may be desired by bidders must be requested of the supervising engineer in writing, and any answer will be sent officially to each intending bidder to whom a set of drawings and specifications has been delivered.

Bond.

33. The successful bidder must furnish a bond in a sum equal to 50 per cent of the amount of the contract, with sureties satis-

factory to the Department, guaranteeing the fulfillment of all provisions of the contract, the satisfactory completion of the work included therein within the stipulated time, the prompt payment of all persons furnishing materials or labor required in the prosecution of the work, and covering all guarantees herein provided for. No payment will be made on this contract until the bond has been submitted to the Department and approved by the Secretary of Agriculture.

Time Limit.

34. Each bidder must state the time in which he proposes to complete the work, which time should not be more than twenty-four months. The bidder is at liberty to state in his proposal a longer time for completion if he considers it impracticable for him to complete the work within the period named, and he is also at liberty to name a shorter time, if, in his opinion, his work can be completed and he will agree to complete the same within such shorter period. The item of time required for the completion of the work will receive consideration in the award of the contract, and it will be an obligation of the contract that the work as a whole, or any and all parts of the same, shall progress at all times with a proper and sufficient force of workmen and an ample supply of materials, and that it shall be conducted and managed in a manner satisfactory to the supervising engineer, and which, in his opinion, shall insure its completion within the time stipulated. The contractor will be strictly held to this provision.

Designation of Parties and Terms.

35. Wherever the word "architects" is used herein it shall be held to mean John Hall Rankin, Thomas M. Kellogg, and Edward A. Crane, doing business as Rankin, Kellogg & Crane, the architects of the building.

36. Wherever the word "bidder" is used herein it shall be held to mean any individual or firm of individuals, or any member of any firm or any corporation signing a bid submitted.

37. Wherever the word "contractor" is used herein it shall be held to mean any individual or firm of individuals or any corporation who may contract with the United States to do the work or furnish materials under this specification. In using the pronoun designating a bidder or contractor, the third person singular is adopted whether the contract is in the hands of an individual, firm, or corporation.

38. The contracting officer on the part of the United States is the Secretary of Agriculture; the officer appointed by him to supervise the construction of the building is designated in these specifications as "supervising engineer." The present incumbent of this office

is Capt. John Stephen Sewell, Corps of Engineers, U. S. Army. The word "supervising engineer" shall be understood to apply to him, or his successor, duly appointed by the Secretary of Agriculture.

39. "Superintendent" shall be held to mean the principal inspector or superintendent of construction appointed by the Secretary of Agriculture to remain continuously upon the work. This officer will be subject to the immediate orders of the supervising engineer.

40. All orders to the contractors will be given through the supervising engineer or his authorized representatives or subordinates. This is not intended to prevent the architects from exercising proper control and supervision over parts of the work having a bearing on its artistic value, but merely to establish the channel through which such control and supervision shall be exercised. The supervising engineer will be guided in all matters purely artistic absolutely by the advice of the architects. Matters affecting the safety, stability, or fireproof qualities of the building or buildings will be settled by the supervising engineer in consultation with the architects, in so far as they have a bearing on the artistic value of the design; otherwise, by the supervising engineer alone.

41. By "mechanical engineer" is meant the person duly appointed by the Secretary of Agriculture for the purpose of designing and superintending the installation of the mechanical equipment of the building or buildings. All matters pertaining to the mechanical equipment will be settled by the mechanical engineer acting through the supervising engineer. It is possible that the functions of "superintendent" and "mechanical engineer" may be united in one person.

42. In all technical matters relating to the construction and finish of the building, and in all questions of amount of work on which payments are earned, the decision of the supervising engineer, acting in consultation with the architects and mechanical engineer, shall, in general, be final.

43. The word "similar," when used in drawings or specification, shall not be considered as meaning identical, but the items so described must in each case be worked separately to suit conditions in a manner like or similar to the example referred to.

Routine of Business.

44. After the award and signing of the contract, all business relating to the work shall be transacted through the office of the supervising engineer, except as otherwise herein provided.

Photographs.

45. The contractor is to procure and pay for photographs to show the general condition of the work, and is to furnish triplicate cloth-mounted prints of each view to the supervising engineer free of

charge, two of which will be filed with the Department and one in the office of the architects.

46. Each negative to be numbered and dated and taken from such points as will best show the condition and progress of the work, the points to be designated by the supervising engineer; negatives to be filed with the Department after prints have been taken.

47. There will be required an average of two negatives per week, size 8 by 10 inches. Should it be impracticable to procure this number of satisfactory views each week in any month, an additional number may be required in subsequent months to make up the average. These photographs are to be skillfully executed by a photographer to be approved by the supervising engineer, and the contractor in bidding upon this work is to take this into account and estimate accordingly.

48. These photographs will be taken as conclusive evidence of the progress of the work.

Variation from Requirements of Drawings and Specification.

49. No change, variation, or deviation from the drawings or specification which diminishes the structural strength of the building, involves any difference in the cost of construction, diminishes the value of the work or material to be supplied, or which may in any manner be a departure from the spirit of the design, or which may form the basis of any claim on the part of the contractor for extra compensation, shall be made, except by written order of the supervising engineer, approved by the duly authorized representative of the United States. In case any change shall involve modification of design or affect the artistic excellence of the building, the order therefor must also be approved by the architects.

50. Minor changes not coming within the above provision and involving no change in cost may be made upon the written order of the supervising engineer, but not otherwise.

51. The contractor shall make no change or variation of any kind from the strict requirements of the drawings and specification throughout the work or any portion of the same except upon a written order calling for such change.

52. Should the contractor, without due authority, use in the carrying out of this contract any material other than that specified, or should he make any unauthorized changes or variations from the work shown by the drawings, the supervising engineer shall have the power to condemn and reject such work and material and to require its immediate removal from the premises as hereinbefore provided, or he shall have the right to accept such work and material, with the approval of the duly authorized representative of the United States (should such action in his opinion be desirable or necessary to avoid

delay or to otherwise protect the interests of the Government), and to make a deduction in the contract price in consideration thereof as may in his opinion be just and equitable, and to fix and determine the amount of such deduction, and his ruling shall be final, conclusive, and without appeal.

53. Should the contractor find at any time during the progress of the work that in his judgment existing conditions demand, make desirable or beneficial a modification in requirements covering any particular item or items, he is required to promptly report such matter to the supervising engineer for his decision and instructions.

Extras.

54. No additional compensation shall be due the contractor for performing any work or furnishing of any material whatever, except in accordance with written agreement or by written order duly approved by an authorized representative of the United States as herein provided, and the agreement or order must state distinctly that additional compensation is involved. No order authorizing or directing a modification or change in the work or material shall be construed to involve any extra compensation unless it so provides. Modifications involving a change in compensation will be provided for in articles of agreement supplemental to the principal contract.

Visits.

55. The United States reserves the right to require the contractor or his authorized representative to visit the office of the supervising engineer or the building at his own expense whenever such a visit is considered to be in the interest of the work, or that a conference is, in the opinion of the supervising engineer, necessary for an early adjustment of any complicated or unsatisfactory conditions that may have developed in connection with his contract, but the result of such conference shall not be binding until formally approved in writing.

Protection during Construction.

56. During the progress of construction, the contractor must protect all work from injury or defacement, and particular care must be taken of all finished parts. All projections, angles, door and window jambs, entrances, stone steps, and all work liable to be injured during construction is to be properly protected with board casings, planks, etc., and the top of all unfinished walls must be completely covered with boards, for their protection, whenever leaving off work. All floors, core holes, etc., must be entirely covered over and kept free from snow and ice in cold weather.

57. The contractor shall provide and hang temporary doors and inclosures so that the building may be put under lock and key as

soon as possible, and shall provide keys for the supervising engineer and his subordinates. He shall make good any defects, settlements, shrinkages, or other faults in the work arising from improper materials or workmanship, which may appear within one year after the completion and acceptance of the building, and shall keep the building in repair for that period free of expense to the United States, except as otherwise provided herein. Part or full payment for the work shall not relieve him in any way from such responsibility, but this guarantee shall not apply to injuries occurring after final acceptance and due to malicious or careless action of parties not properly under the contractor's control, or to violence, abuse, or carelessness of other contractors or their employees, or the employees or agents of the United States.

Water.

58. The contractor shall furnish and pay for all water needed for his work, and all piping and connections for the same. All water used for construction must be clean water from city mains or other satisfactory source of supply approved by the supervising engineer.

Temporary Heat.

59. After the building is roofed in, window and door openings are to be temporarily closed, and from the 1st of December to the 1st of April and at such other times as may be directed by the supervising engineer, until the completion of the buildings, he shall heat the buildings in an approved manner to a temperature not less than 50 degrees Fahrenheit before plastering, and not less than 60 degrees Fahrenheit after plastering.

Removal of Rubbish, etc.

60. All refuse materials and rubbish that may accumulate during the progress of the work must be removed from time to time as may be directed by the supervising engineer, and on completion of the building, streets and premises must be cleaned up and the surplus materials and rubbish removed. Dry rubbish must be well sprinkled to prevent dust.

Scaffolding, Hoists, Derricks, etc.

61. The contractor is to supply all manner of tools, machinery, centers, hoists, derricks, together with all guys and anchorage for the same; templets, planking, scaffolding, etc., necessary to execute the work, and the centers and scaffolding must be safe and suitable for the purpose.

Watchmen and Danger Signals.

62. Upon receipt of instructions from the supervising engineer after this contract shall be in effect, the contractor shall take possession of the entire portion of site inclosed by fence hereinafter

specified, abutting sidewalks, etc., and he shall then assume all responsibility in connection therewith for the care, preservation, and protection of the same, and shall keep and maintain one or more watchmen on the site at all times, both day and night, and as many additional watchmen as the exigencies of the work may require. He shall also put up and maintain all necessary danger signs, signals, red lights, guards, protective inclosures and platforms, and all proper notices for the protection of the work and the public as may be necessary to warn all persons in case of danger, and to protect the public against accidents.

Piling of Building Material.

63. The contractor shall pile or arrange in a neat and orderly manner (inside of fence) all building materials when delivered at the building, in such a way as to give convenient access to the same in order of requirement, and for the purpose of inspection without disarranging or removing such piles, and without occupying unnecessary space. He shall not interfere with the supplying, hauling, handling, and stacking of materials in like manner by other contractors, but shall arrange all reasonable facilities for such work, and in case of dispute, the directions of the supervising engineer shall be followed.

Risks, Blame, etc.

64. The contractor is to assume all risks and bear any loss occasioned by neglect or accident during the progress of the work, until the same shall have been completed and accepted by the United States.

65. He must properly protect any pavements of this property during the progress of the work, and make good any injury that may have occurred to any adjacent building in consequence of the erection of this work.

66. He is to be responsible for all damage to persons or property which may occur in connection with the work; comply with all laws, municipal building regulations, or ordinances, so far as the same are binding on the United States, and obtain at his own expense all required licenses and permits.

67. He must also agree to protect and save harmless the architects, the United States, and their agents and employees from any and all demands of any nature and kind because of the use of patented articles and devices included in the materials agreed to be furnished by his contract.

Cooperation.

68. All contractors who shall do work under this specification are to cooperate with one another to the end that the whole work may proceed to the best advantage and with due promptness.

Samples.

69. Samples are required from all bidders, with their proposals, of all exterior face stone as specified under "Exterior stonework" and of such other materials or articles as may be required herein, all to be delivered prepaid.

70. The successful contractor must forward, charges prepaid, to the Department of Agriculture, samples in triplicate (unless particularly specified to be in duplicate) of all material called for, with labels showing the name of the contractor by whom and the building for which they are submitted, and the supervising engineer shall be notified by letter of the shipment of each lot of samples. Rejected samples will not be returned except upon request, and then only at the expense of the contractor.

71. Generally, no material, device, or fixture shall be delivered or used in the work until samples of the same shall have been submitted and approved, as above provided.

72. In certain cases, at the discretion of the supervising engineer, devices and fixtures may be submitted for approval by cut or description.

73. The following must be submitted within six weeks after the award of the contract in as few shipments as possible, and during the progress of the work such others as may be necessary to fulfill the above conditions, allowing ample time for their consideration:

Portland cement,	} About 2 quarts of each kind in tight tins.
Nonstaining cement.	

Sand.

Clinkers.

Foundation stone.

Enameled brick, both straight and round cornered.

Common brick, both straight and round cornered.

Asphalt.

Wall ties.

Cramps.

Anchors.

Broken stone.

Templets.

74. All moldings are to be accurately cut to correspond throughout their length with the full-size details. This requirement is positive, and the contractor shall, at his expense, furnish for the use of the supervising engineer templets of zinc or other satisfactory metal for the verification of all moldings. Templets to be distinctly labeled, to follow the full-size drawings, and to be furnished for all stone, marble, wood, iron, and plaster moldings.

Work not Included.

75. The heating and ventilating apparatus, the register faces of the heat and vent flues, the electric wiring, conduits, and light fixtures, elevators and their machinery, etc., special ironwork in connection therewith, and finished approaches are not included in this specification, and will be provided by the United States under other contracts.

Survey and Test Levels.

76. The contractor must employ and pay for the services of a competent engineer or surveyor to lay out the lines of the building, test levels of excavations and footings; also of water table, floors, and main cornice course, when the work shall have been completed to said points, and to test the levels and grades of drain and sewer pipes, forwarding to the supervising engineer the certificate of such engineer guaranteeing the correctness of the various levels, and he shall also furnish to the supervising engineer, if demanded, the certificate of the Engineer Department, District of Columbia, showing that the finished grades and lines conform to those established by the municipal government of the District of Columbia.

77. All work of every character and kind is to be laid out by the contractor, who will be held responsible for its correctness, and no plea as to the acts, orders, or supervision of the supervising engineer, or any person, shall be admitted in justification of any error of construction or departure from the terms of the contract.

78. The contractor must provide good and accurate surveying instruments for laying out the building; these must include an engineer's transit, an engineer's wye level, and a steel tape. All of these instruments must be satisfactory to the supervising engineer and must be at his disposal whenever he desires to check up the layout of any part of the work. The transit must have a vertical limb.

Explanation of Drawings.

79. Brickwork on drawings is indicated in section by plain hatched lines. Terra cotta furring is indicated on floor plans by solid black and in section by crinkled hatched lines. Flue linings are indicated by solid black lines on floor plans and in section by broken hatched lines on details. Marble and other stonework is indicated in section by fine stippling; and concrete is indicated by coarse irregular stippling. Concrete floor construction is indicated by cross hatching in addition to stippling. Plaster and metal work is indicated in solid black, and metal in certain cases by double cross hatching. Woodwork to small scale is in solid black; to larger scale it is indicated by fine cross hatching.

80. Certain drawings are shown with the detail drawn out on one side only of the central line. Such must be considered as substantially symmetrical and the detail to be repeated on the outlined

half. Carving, dentils, modillions, etc., indicated by starting are to be carried out in accordance with the intent of the drawings, and diagrams showing spacing of dentils, modillions, and other repeating members are to be submitted to the architects through the supervising engineer for approval before work is executed.

81. The general character of work is shown on scale drawings, but all details will be subject to minor modifications in the full-sized drawings as hereinbefore stated.

Office Building.

82. The contractor is to provide for his own use as soon as possible after the execution of the contract, an approved wooden office building located at a convenient point on the site as may be required, the same to be temporary in character, but neatly finished and painted throughout, in which he shall provide for the supervising engineer and the architects a room about 15 by 20 feet, with at least four windows with shades, and a separate entrance door with a flat-key lock. Sign to be lettered on the door as directed. Room to be neatly ceiled up and finished complete inside and painted.

83. The contractor to furnish for the building, janitor's services, heat, and light, and he will also provide two plain pine tables 5 by 8 feet, with drawer, and three wooden chairs for the office of the supervising engineer and the architects.

84. The contractor shall provide for his own office telephone services; the supervising engineer and his subordinates to have free city use of same.

Water-closets.

85. The contractor is to erect at a convenient point upon the site a temporary water-closet building for the use, under proper restrictions, of employees of all contractors upon the work, having approved urinal latrine and wash-down closets with combined hopper and trap, for at least twelve persons, each fitted up with automatic flushing cisterns complete, also one large iron sink.

86. He will also provide for private use in another room of this building, having a separate entrance door with flat-key lock, at least two wash-down or siphon-jet closets with cisterns complete, inclosed in suitable wood partitions and slat doors, and one iron sink. If he so desires, he may instead place a water-closet and wash bowl in a small room adjoining his office, and one of each in a small room adjoining the supervising engineer's office.

87. All fixtures to be properly fitted with necessary piping, traps, clean-out valves, and fittings, properly connected to water supply and sewer, all in accordance with city regulations.

88. House to be neatly finished, painted inside and outside, to be provided with janitor's services, paper, heat, and light, and to be kept in a neat and sanitary condition until completion of building.

Fence.

89. Contractor shall immediately inclose the site as shown by diagram on drawing No. 274-63.

90. Fence to be constructed of 6 by 6 inch chestnut or cedar posts with heavy butts, 8 feet apart, to have three intermediates of 2 by 4 inch material; a 12-inch board 1 inch thick is to be carried around the bottom of the fence at the ground level, and above this the boards will be $\frac{3}{4}$ -inch matched boards not over 6 inches wide, laid vertically, and finished with proper cap and water table. Fence to be carefully stayed against wind pressure, and to be kept in repair until removed. All lumber, except posts, to be Virginia or North Carolina pine. Finished height of fence to be not less than 7 feet.

91. The contractor shall provide at least four large sliding gates at convenient points to give access to teams, etc., all to be provided with heavy hasps and padlocks and suitable hangers with track. He shall also provide at least two small gates or doors with proper hinges and flat-key locks for the use of persons having business upon the site. All gates to have approved notices relating to the admission of only those having business to transact, and the contractor shall see that the notices are observed.

92. The contractor is to provide and hang additional gates where directed, if at any time during the construction of the building such additional gates may be considered desirable by the supervising engineer.

93. The contractor shall not himself nor permit any party or parties to post any bills or place any advertisements upon this fence or any of the gates, and he shall post proper notices to this effect. He may, however, maintain two signs for himself and two signs upon which may be placed the names, business, and business addresses of the subcontractors, in plain letters done in black and white. Size, character, and position of these four signs to be subject to the approval of the supervising engineer.

94. The entire exterior of fence is to be kept neat and clean, and both sides to be painted with two coats of paint.

Elevated Passageway.

95. The contractor shall construct, at point shown on location plan, an approved covered elevated passageway to conform in character and finish with fence above specified. This passageway to be of sufficient height to allow a free thoroughfare beneath, and to be provided at both ends with steps and substantial closed parapet rails on each side, throughout entire length. Passageway to be securely roofed over in such a manner as to be entirely waterproof. Floor to be of $\frac{3}{4}$ -inch tongued and grooved North Carolina flooring. Entire passageway, except floor and steps, to be painted as specified for fence.

Before erection of this passageway, the contractor shall furnish a drawing of same, to be submitted to the supervising engineer for his approval.

Removal of Fence.

96. Upon the completion of his contract, the contractor shall remove, without charge, the entire fence and covered passageway when so ordered by the supervising engineer, and repair, to the satisfaction of the supervising engineer, any and all damage to streets, etc., caused by its construction and maintenance, material to remain the property of the contractor.

Care of Trees and Sidewalks.

97. The contractor shall remove only such trees as are upon the ground to be actually occupied by the building or condemned by the supervising engineer. All others within space inclosed by fence he shall carefully box and protect from damage. He shall also protect and keep in order the sidewalks and curbs adjacent to the inclosed space as may be directed by the supervising engineer.

DEMOLITION.

98. Such buildings now on the site as it shall be found necessary to remove to make room for the new structures will be removed by the United States.



EXCAVATION.

General.

99. The general excavation for the building to be carried down to proper depth below the finished line of the sub-basement floor, and extended laterally as may be necessary for the proper building of the foundation walls, drainage system, dry wells, etc., and all work shown or specified; the trenches for footings to be leveled true to grades shown, and the earth not disturbed below bottom line of footings; sides to be properly protected to prevent caving and all necessary shoring to be provided by the contractor. Excavation in all cases to go down to solid natural foundation. All excess earth to be removed from the premises.

Top Soil.

100. The top soil is to be stripped and hauled to the corner of B and Fourteenth streets NW., and piled or roughly spread, as directed.

Old Pipes.

101. All pipes, sewers, or other piping encountered in excavating must be removed back to the lot lines, cut and securely plugged to the satisfaction of the supervising engineer. This must be done in such a manner as not to interfere with supply and waste of the existing buildings.

Old Wells, etc.

102. All old excavations, wells, privies, etc., that may be encountered during excavation, under or near foundations, to be cleaned, disinfected, and filled with concrete. Where not near foundations, they may be filled with clean earth carefully tamped.

Impediments.

103. Rocks, bowlders, or other impediments found in excavating are to be removed, all necessary drilling, blasting, etc., done, and all useless materials removed.

Extra Filling Earth.

104. Earth needed for grading, back-filling, etc., must be deposited on the site where the supervising engineer may direct, the top soil to be piled separately as hereinbefore specified.

Water.

105. The contractor must keep the basement clear of water during the prosecution of the work, and as soon as possible shall so grade the surroundings as to shed the water from all excavations.

Back-filling.

106. After the piping, etc., shall have been laid, inspected, and accepted, and foundations completed, all back-filling must be done with clean earth well rammed in layers to the required grades.

Grading.

107. Upon the completion of the exterior walls, such grading shall be done as may be necessary to bring terraces to lines shown.

Shoring, etc.

108. The contractor is specially cautioned against permitting any caving in of banks or trenches and consequent injury to sidewalks and streets, and is referred to "Risks, blame, etc.," paragraphs 64 to 67.

109. No specific method of retaining the sides of pits or trenches for foundation walls or piers, or of the embankments of the general excavation, is required, it being intended to permit the contractor to select whatever method or methods he may desire, subject to the approval of the supervising engineer. Such approval, however, shall in no way relieve the contractor from responsibility.

110. It is required that the method or methods used shall be practicable, and capable of use in an expeditious and effective manner for the exclusion of earth, sand, water, or other material during the preparation of pits or trenches while excavating, or laying concrete and refilling around foundations and piers.

111. Should the contractor not select a suitable method or propose to use an unsuitable one, or if in the prosecution of the work it should appear to the supervising engineer that proper means are not being used, the supervising engineer may require that certain methods be at once adopted, and that experienced men be employed in connection therewith. The enforcement of such demand, however, shall not relieve the contractor of responsibility in any particular, as such action will be taken only in case the interests of the United States shall so require.

112. Wood caissons, sheet piling, or shoring shall be removed entirely unless its removal is impossible, or unless in special cases it may be permitted to remain by the supervising engineer.

Test Loadings.

113. The contractor shall immediately, upon beginning work, excavate for six foundation piers or parts of trenches to grades designated, as will be directed by the supervising engineer.

114. Upon the bottom of such pits he shall place timber platforms, the bottom of which shall be exactly 4 square feet each. The platform shall be loaded with pig iron or other convenient material to a weight of 6,000 pounds per square foot, including therein the weight of the platform.

115. Materials are to be carefully weighed and weights to be gradually applied as will be directed, and accurate levels are to be taken with proper instruments by a surveyor satisfactory to the supervising engineer, and with reference to some prominent level on another building. Levels are to be taken as directed for a period not exceeding one month and records signed by the contractor and surveyor are to be furnished to the supervising engineer.

116. Should the supervising engineer so require, additional loads up to 10,000 pounds per square foot on each pier shall be placed by the contractor, additional levels being taken as above provided. Platform and weights to be removed when directed.

117. If the condition of subsoil as developed by excavation and tests shall make additional test loadings desirable, the contractor shall make as many additional test loadings as above described as the supervising engineer shall direct, on written order to such effect given in accordance with provisions of this specification.

118. The bidder shall state in proposal sheet a price for each test loading additional to the six herein required, which unit rate shall be used in adjusting the cost of such additional work.

Borings.

119. Immediately upon beginning work at the site, contractor shall make the required excavation for certain masonry piers or portions of trenches in locations to be directed by the supervising engineer, and shall make borings in bottom of same not exceeding 20 borings averaging 30 feet deep each below the bottom of the excavation to a total depth of 600 feet in all. If the supervising engineer shall so direct, the depth of the borings may vary, but if the total depth above stated be exceeded, an allowance will be made to cover the cost thereof.

120. Borings to be numbered and a careful record kept of materials found and depth of same, and samples thereof containing 3 cubic inches to be taken at each 4 feet in depth. The holes are to be filled with concrete after borings have been taken.

121. Bids must state a price per linear foot for borings made as herein requested; the right is reserved to increase or diminish the total length of boring, or the depth of any individual boring, and to allow for same at the price per linear foot named in the contractor's bid.

122. It is believed that the soil consists of sandy loam at the level of the bottom of the foundations, and for some distance below, with some gravel, increasing in quantity at greater depths. It is probable that no unusual difficulties will be encountered in the foundation work, but this is not guaranteed by the United States.

CEMENT AND CONCRETE.

General.

123. All cement used for concrete must be a true Portland cement, made from natural rock without the use of furnace slag in any form, whether it is calcined after grinding and mixing with lime or not. Cement for concrete purposes must comply with the following requirements:

124. The average weight per barrel shall not be less than 375 pounds net. Four sacks shall contain 1 barrel of cement. If the weight, as determined by test weighings, is found to be below 375 pounds per barrel, the cement may be rejected, or, at the option of the supervising engineer, the contractor may be required to supply, free of cost to the United States, an additional amount of cement equal to the shortage.

125. Tests may be made of the fineness, specific gravity, soundness, time of setting, and tensile strength of the cement.

Fineness.

126. Ninety-two per cent of the cement must pass through a sieve made of No. 40 wire, Stubb's gauge, having 10,000 openings per square inch.

Specific Gravity.

127. The specific gravity of the cement, as determined from a sample which has been carefully dried, shall be between 3.10 and 3.25.

Soundness.

128. To test the soundness of the cement, at least two parts of neat cement mixed for five minutes with 20 per cent of water by weight shall be made on glass, each pat about 3 inches in diameter and $\frac{1}{2}$ inch thick at the center, tapering thence to a thin edge. The pats are to be kept under a wet cloth until finally set, when one is to be placed in fresh water for twenty-eight days. The second pat will be placed in water which will be raised to the boiling point for six hours, then allowed to cool. Neither should show distortion or cracks. The boiling test may or may not reject, at the option of the supervising engineer.

Time of Setting.

129. The cement shall not acquire its initial set in less than forty-five minutes and must have acquired its final set in ten hours.

130. The pats made to test the soundness may be used in determining the time of setting. The cement is considered to have acquired

its initial set when the pat will bear, without being appreciably indented, a wire $\frac{1}{12}$ inch in diameter loaded to weigh $\frac{1}{4}$ pound. The final set has been acquired when the pat will bear, without being appreciably indented, a wire $\frac{1}{24}$ inch in diameter loaded to weigh 1 pound.

Tensile Strength.

131. Briquettes made of neat cement, after being kept in air for twenty-four hours under a wet cloth and the balance of the time in water, shall develop tensile strength per square inch as follows: After seven days, 400 pounds; after twenty-eight days, 600 pounds.

132. Briquettes made of 1 part cement and 3 parts standard sand, by weight, shall develop tensile strength per square inch as follows: After seven days, 200 pounds; after twenty-eight days, 275 pounds.

133. The highest result from each set of briquettes made at any one time is to be considered the governing test. Any cement not showing an increase of strength in the 28-day tests over the 7-day tests will be rejected.

134. When making briquettes, neat cement will be mixed with 20 to 25 per cent of water by weight. After being thoroughly mixed and worked for five minutes, the cement or mortar will be placed in the briquette mold in four equal layers, and each layer rammed and compressed by thirty blows of a soft brass or copper rammer $\frac{3}{4}$ inch in diameter (or 0.7 inch square, with rounded corners), weighing 1 pound. It is to be allowed to drop on the mixture from a height of about $\frac{1}{2}$ inch. When the ramming has been completed, the surplus cement shall be struck off and the final layer smoothed with a trowel held almost horizontal and drawn back with sufficient pressure to make its edge follow the surface of the mold. The method of compacting the briquettes in the molds may be varied, provided a method of equal efficiency with that specified is adopted.

135. The above are to be considered the minimum requirements. Unless a cement has an established reputation for excellence, the contractor must deliver a sample barrel for test before beginning work. If this sample shows higher tests than those given above, the average of tests made on subsequent shipments must come up to those found with the samples.

136. A cement may be rejected in case it fails to meet any of the above requirements. An agent of the contractor may be present at the making of the tests, or, in the case of the failure of any of them, they may be repeated in his presence. All of the tests must be made by some one of recognized skill, who must be satisfactory to the supervising engineer. All expenses of such tests to be paid by the contractor. All such tests shall be made on samples furnished from cement actually delivered for use on the work. One sample must

be taken from every ten barrels, unless a smaller number shall be specifically authorized by the supervising engineer.

Delivery.

137. The cement must be delivered on the site in the original packages with the brand and maker's name plainly marked thereon, and the cement must be kept dry, ready for use.

138. The contractor must, at an early stage in the work, erect at a point to be approved by the supervising engineer, a cement shed capable of holding at least two weeks' supply of cement. The cement must be delivered to this shed and the seven-day test must be completed before it shall be used.

139. The contractor shall furnish to the supervising engineer semi-monthly statements certified to by the contractor and the dealer furnishing the cement, showing the amounts and kinds furnished and delivered.

Proportion of Cement.

140. In the proportioning of concrete, 375 pounds of cement, net weight, will be assumed to be one-seventh of a cubic yard in volume.

Sand for Concrete.

141. Sand to be a coarse, clean, sharp, bank sand, screened to remove pebbles larger than a pea, and free from loam or clay. Sand which has been dredged from salt water or bank sand washed with salt water will not be acceptable.

Stone for Concrete.

142. Concrete may be made of broken stone, clean gravel, or broken bricks, according to circumstances. Broken stone, where used, must be a clean, hard rock, broken to pass a 2-inch screen. It must be free of fine dust, but otherwise just as it comes from the crusher, including all sizes from that of fine sand up to the 2-inch stone. Gravel must be perfectly clean and vary in size from coarse sand or a small pea to not over 2 inches in diameter. Broken brick must be broken to pass a $1\frac{1}{2}$ -inch screen and must be free of fine dust.

Boxing for Concrete.

143. Footings for all walls, piers, etc., to be laid in plank cribs of the dimensions required; planks to be removed before back filling unless in special cases they may be permitted by the supervising engineer to remain.

144. In case the soil will permit of neat excavation, planking may be omitted upon the written approval of the supervising engineer, but in this case any concrete damaged by earth caving in on it must be taken out and replaced by the contractor at his own expense.

Composition of Concrete.

145. For footings under piers, columns, walls, etc., concrete must be mixed in the proportions of 6 parts of broken stone or gravel, $2\frac{1}{2}$ parts of sand, and 1 part of Portland cement. All stone and sand must be actually measured. Cement must be weighed from time to time to determine whether the barrels are of full net weight or not. Concrete which is put in to take the place of soft material, or else used as a foundation for a cement or asphalt floor, may be mixed with broken bricks, broken stone, or gravel. Where used for the foundation of a floor, it will be mixed as above prescribed for footings. Where it is used to take the place of soft material, it may be mixed in the proportions of 10 parts broken stone or gravel or brick to 4 parts of sand and 1 part of Portland cement.

Machine Mixing.

146. All concrete may be mixed by any power-driven machine which mixes a batch at a time and produces a result satisfactory to the supervising engineer. Continuous mixers will not be allowed. If the contractor prefers, he may mix by hand, as follows:

147. Sand and cement, of qualities elsewhere specified, to be mixed dry on special platforms or shallow boxes, being first accurately measured in proportions specified. No "guesswork" will be allowed. The proper quantity of water to be added by means of a hose sprinkler, and material to be thoroughly mixed to a stiff paste. Stone to be drenched and drained, placed upon the cement mixture, and turned over sufficiently to thoroughly incorporate the whole mass, but not less than four times. All parts of stone to be coated with the cement mortar, and all parts of mortar to be wet, but only sufficient water to be used to accomplish such result.

Tamping of Concrete.

148. All concrete must be placed in position immediately after mixing. It must be thrown into the trench or box from a level not more than 6 feet above the bottom and be at once tamped solidly in place in layers not exceeding 12 inches in thickness, using a maul for this purpose which shall be heavy enough to secure perfect consolidation, and have the striking surface made of hard wood cut across the grain so as not to break small pieces of the aggregate in the process of ramming. The work on any unit of concrete must be as nearly continuous as possible, so as to make the work as nearly monolithic as possible. Concrete must be placed in position wet enough to cause decided quaking after vigorous ramming. If caisson work be used, special means for filling the same must be adopted; the method adopted must be approved by the supervising engineer.

149. No wet or moistened mixture containing cement shall remain unplaced for a period exceeding thirty minutes, and must not be used at all after its initial set. Any such mixture having its initial set before being placed must be removed from the premises or used as dirt filling.

Layers to be Swept.

150. The concrete work which is being built up in layers is to be swept clean with brooms, sprinkled with a hose, and if considered necessary by the supervising engineer, made rough by means of a pick before adding next layer. Where a good bond is essential, the surface must also be covered with 1 inch of a mortar made of 1 part of coarse sand and 1 of Portland cement.

Top Surface.

151. The top surfaces of concrete footings, when finished, to be brought to a smooth even surface, and to be finished with cement mortar if necessary to bring them to such a surface. Cement mortar to be mixed in the proportions named above for mixture of cement and sand.



CEMENT FLOORS.

General.

152. The entire floor of the subbasement, including duct where shown, is to be laid in cement.

153. After drains, inlets, etc., are laid and approved, the filling in over the same is to be carefully done and puddled or tamped, as may be directed by the supervising engineer, after which the entire surface of the ground is to be leveled up.

Concrete.

154. A course of 4 inches of concrete is to be laid and carefully tamped, graded as directed. Finish to be 1 inch of top dressing, carefully graded and troweled, and divided into squares as directed. The supervising engineer may direct that floor in certain cases be not laid until machinery is set. Concrete to be same as specified under "Cement and concrete work," and is to be laid in the same general manner.

Top Dressing.

155. All top dressing for cement floors to consist of 2 parts of cement and 3 parts of very coarse clean sharp sand, properly mixed, as specified under "Cement and concrete work," and spread upon the concrete base, dusted with cement, and troweled to a hard finish.

156. When difference of levels in subbasement requires steps or parapets, they are to be carefully finished with rounded edge.

157. Sides of duct in subbasement to be plastered with top-dressing mixture.

158. Where cement floor joins floor drains joints must be made with care and neatness. Top dressing to be laid within twelve hours of the laying of the concrete base.

Closet Floors.

159. Floors of all closets not otherwise specified to be of cement.

Area Paving.

160. Floors of areas to have 18 inches of dry furnace clinkers as specified for filling over upper floor arches, finished with 4 inches of concrete and 1 inch of cement top dressing, graded to drain, same to be laid as above specified. In case furnace clinkers are not obtainable, or are more expensive, coarse broken stone or broken bricks may be substituted therefor.



BRICKWORK.

Common Brick.

161. All cellar and foundation walls above concrete footings, all piers and interior walls shown as brick, all subbasement duct walls, and all backing of exterior walls or other walls shown to be faced with white brick, stone, or marble, to be built of straight, sound, hard, well-burned bricks, firm in texture, even in size, and free from limestone pebbles, laid in a first-class manner, bonded throughout with headers every fifth course, and full thickness of wall or backing, thoroughly bedded and jointed in cement mortar as specified hereafter, with close joints flushed full of mortar, even if calking be necessary to secure the result. All joints to be pushed or shoved, thoroughly working in the mortar with the trowel when necessary. Soft bricks or lots containing soft bricks will not be accepted. No bats will be allowed except for closers. This requirement is absolute and will limit the number of bricks laid per day by each bricklayer. The requirements of these specifications can be best fulfilled by spreading the mortar separately for each brick and then shoving the bricks into place so as to squeeze the vertical joints full of mortar. Bidders should estimate accordingly.

162. Throughout the subbasement, except where enameled brick or plaster is specified, the inside of walls to be neatly laid with struck joints; exterior angles to be laid with round-corner bricks.

163. Certain openings in subbasement to have sills formed of a course of bricks laid on edge.

164. Walls of dry wells to be 9 inches thick, of hard brick, laid dry. Same to be covered with 9-inch turtle-back arches laid in cement mortar. Upper 2 feet of walls to be laid in cement mortar.

Hollow Brick.

165. The inside 4 inches of all exterior brick walls above subbasement to be approved hard, hollow bearing brick, well bonded into main wall by means of full header courses. In the subbasement the exposed walls to have a vertical course of same hollow brick, but it is to be that one next to the inner course, and the bond must not in any case be sacrificed. Bonding by metal ties, chipped brick, etc., will not be accepted. This means that where hollow bricks are used all headers must be hollow bricks.

Pipe Sleeves.

166. Pipe sleeves of cast iron, 2 inches larger in diameter than the pipes which are to be run through same and of proper lengths

for the thickness of the walls, will be provided by the plumber and must be built in with the masonry where directed for the passage of the drain water pipes specified.

167. Sleeves for steam pipes, gas pipes, and electric conduits will be provided by the United States under another contract, but are to be built in by the mason under this contract where directed.

Skewbacks, etc.

168. Properly made corbels and skewbacks, wherever same may be required, must be formed in the walls for springing arches; and offsets, bevells, etc., must be properly cut where required.

Centers.

169. Arches, both flat and curved, are to be built on strong wood centers and properly keyed; the centers not to be struck until the mortar shall have thoroughly set.

Arches.

170. The arches over interior openings to be full thickness of the walls, the relieving arches of the exterior openings to be the full depth of reveals.

171. Arches 3 feet and under to have two rings, others to have an additional ring for each additional 3 feet of width. Rise to be not less than $1\frac{1}{4}$ inches for each foot of opening width.

172. The small openings in interior walls, and heat and vent flues, etc., to have flat arches, unless otherwise shown.

Vent Shafts, Flues, Chases, etc.

173. The interior of vent shafts, the heating and ventilation flues and chases to be built true, with selected fair brick, neatly trowel pointing the joints; the back of chases to be plumb from bottom to top. Flues for heating and ventilating purposes to be carefully constructed in the positions indicated on the drawings and the brickwork to be built close around the terra cotta and galvanized-iron flue linings hereinafter specified, keeping the flue linings above the stonework and brickwork, while the walls are being built, protecting the flues with strong wooden boxing whenever leaving off work, and keeping the flues at all times clear of mortar.

174. Where required, bricks shall be laid to project at intervals for the proper bracing of the terra cotta flue linings elsewhere specified.

175. The attention of the contractor is particularly called to this portion of the work, and should any doubt arise as to the meaning of the drawings in regard to the dimensions or location of the flues, chases, etc., application must at once be made to the supervising engineer or superintendent for specific information.

176. The run of flues is shown by the details.

177. Chases for pipes, wires, etc., to be located as directed, and the contractor shall apply to the supervising engineer or superintendent for exact information.

178. The three main vent shafts in each building, from subbasement floor to top of shafts, to have ladder rungs of $\frac{7}{8}$ -inch round iron 3 feet long, bent and turned up 2 inches. They are to be built into walls 4 inches, seven courses of brick apart, forming a ladder 12 inches wide. Rungs to be heavily painted with asphalt paint.

Wetting Brick.

179. All bricks must be thoroughly drenched immediately before being laid, except in very cold weather, as may be directed by the supervising engineer.

Heating Brick and Mortar.

180. Bricks laid in cold weather must be heated and mortar therefor must be made up with hot water; bricks to be laid while both brick and mortar are warm, in small lots, and then be covered temporarily with suitable protecting covering. Space around newly laid brickwork under such covering to be kept warm by suitable means until mortar has sufficient time to set, after which another lot of brickwork may be laid, protected in the manner above described.

181. All brickwork laid when temperature is below 32 degrees F. to be protected in this manner, unless the supervising engineer shall consider it unnecessary and shall so direct. No brick shall be laid when the temperature is below 18 degrees F. unless in case of emergency as may be determined by the supervising engineer.

182. Any masonry damaged by freezing or too rapid drying must be torn out by the contractor and replaced by good work, all at his own expense. The United States will not in any case assume responsibility for damage to masonry work due to unfavorable conditions of the weather.

Building of Walls.

183. The walls of each building to be built uniformly, one scaffold in height at a time, the courses of brickwork to be kept level, the faces of walls plumb and out of wind; the dimensions of walls, etc., to be the full heights and thickness shown.

184. Over all doors connecting the various rooms, an opening of size and shape directed is to be left for the passage of certain pipes. Brickwork to be built around the pipes after same have been set in place.

Building in Iron and Wood Work.

185. The contractor to level for and accurately set the bedplates and properly build in all the work coming in connection with the

walls, including anchors, tie-rods, cramps, etc., and all woodwork required to be built in.

Anchors.

186. Anchors for ends of girders and beams will be supplied with the structural steel, mason to build same in place, and work is not to proceed beyond point for building such anchors in place until same are supplied.

187. Anchors for stonework to be supplied with stonework, same to be properly built in as above specified.

188. Anchors for terra cotta furring to be supplied and built by this contractor in inner surface of all exterior walls, including sides of recesses at windows and other openings, and walls above and below these openings, unless otherwise specifically directed by the supervising engineer. Inside of walls adjoining vent or hot-air flues or inside of chases need not have furring anchors. These anchors are to be 1 by $\frac{3}{16}$ inch flat iron, punched with $\frac{1}{4}$ -inch hole on one end and turned up at the other end. Anchors to be not over 6 inches long each and to be built into the wall with turned-up end inside, end having punched hole to project beyond the inside face of wall not over $\frac{3}{4}$ inch. One anchor is to be provided for each 4 square feet of wall surface and additional anchors at external and internal angles, as may be directed. Anchors to be heavily coated with asphaltum.

Bearing for Beams, etc.

189. In preparing beds for bearing plates or blocks, the mason shall establish accurately the level before reaching same in order that the supporting masonry may be brought to the desired level, leaving only a thin mortar joint under plate or block. Any error made in such levels to be promptly and satisfactorily remedied at the convenience of steel setters.

190. Where this method is found impracticable, slate or fire-clay tiles are to be used to gain the proper level, and they are to be carefully bedded.

Inclosing Electric Conduits.

191. The steam-heating plant and electric conduits, switchboxes, etc., will be supplied by the United States under another contract.

192. Whenever they are placed in advance of partitions, this contractor must properly work around and inclose the pipes, conduits, boxes, etc., as directed, and carefully avoid injury to the same.

Joints.

193. The exposed joints of brickwork of walls which are to be plastered are to be cut off rough for plaster key, the joints of other portions to be neatly trowel-pointed.

194. The joints of the brickwork, where flashing will be required, are to be raked out to a depth of 1 inch at a height of at least 8 inches above the roof line, for the securing of cap flashing.

Mortar.

195. All common brick not otherwise specified to be laid in Portland cement mortar, cement to be as specified under "Cement and concrete work."

196. Brick backing for marble-faced walls, or coming in contact therewith, to be laid in nonstaining Lafarge cement mortar.

197. Backing for granite-faced walls to be laid in Portland cement mortar as specified for "Brickwork."

Nonstaining Cement.

198. Mortar for all brickwork used in backing for marble-faced walls, or coming in contact therewith, to be made of Lafarge nonstaining cement and clean sand in the proportion of 1 part cement to 2 of sand. White sand must be used if required for the necessary color effect.

Tests.

199. Tests shall be made of this cement as provided under "Cement and concrete work," as may be required by the supervising engineer; but the tensile strength usual in good Lafarge cement will be satisfactory.

Care and Delivery.

200. This cement shall be delivered and cared for as provided for Portland cement under "Cement and concrete work."

Proportions of Mortar.

201. Mortar for brickwork to be mixed by actual measurement in proportion of 3 parts sand and 1 part cement, no "guesswork" in measurement being allowed. Sand measures to be struck off on top with a straightedge. Cement measure to be a packed measure as delivered from the manufacturers.

202. To each batch of mortar may be added 10 per cent approved lime paste, same to be carefully mixed and incorporated with the other ingredients. If this proportion of lime paste shall at any time be exceeded, the supervising engineer shall have power to forbid the use of any lime in cement mortar.

203. Lime for use in mortar must be thoroughly slaked for at least a week before using. For lime paste may be substituted an equivalent amount of hydrated lime guaranteed to contain not over 1 per cent of free lime.

Mixing of Mortar.

204. Mortar to be mixed by power machine as far as shall be found practicable, except only in cases where small batches are required or

machine is temporarily disabled, as the supervising engineer shall permit. No hand mixing to be done without the supervising engineer's approval, in a manner satisfactory to him and in accordance with his directions, securing the thorough incorporation of all materials.

205. Machine used for mixing mortar shall be one which is capable of and shall actually accomplish the thorough incorporation of all portions of materials used, and which shall leave no portion of sand uncoated with cement. Each batch to be mixed separately. No continuous mixing will be permitted.

206. Material shall be prepared for the machine in an approved manner which shall secure the uniform proportions specified throughout all parts of the entire volume of mortar mixed.

207. Bricklayers to be kept supplied with water for tempering and no mortar to be used unless the same is properly tempered.

208. Only the quantity of mortar required for one hour's use to be mixed at one time, and no mortar to be used after its initial set.

Face Brick.

209. The outside facing of the top story, the inside facing of balustrade parapets and pediments of roof, and the facing of certain east, south, and west walls as shown and marked "white brick" on drawings, to be an approved light-cream or white brick, not enameled.

210. The face brick to be carefully laid and pointed, and to be bonded to backing with a full row of headers every seventh or eighth course as may be found practicable.

Mortar for Face Brick.

211. All face brick to be laid in nonstaining cement mortar as hereinbefore specified if marble facing be selected; in Portland cement mortar as hereinbefore specified if granite facing be selected.

Cleaning and Pointing.

212. At the completion of the brickwork, the brick facing to be cleaned down with an approved wash, as specified for "Stonework," taking care that the stonework be not spotted or damaged, and all joints carefully pointed with cement mortar unless otherwise specified.

Enameled Brick.

213. The interior facing of elevator wells, including division walls and subbasement, to be of approved white enameled brick carefully laid with close joints, neatly pointed and tied to walls every seventh course with enameled-brick headers laid every other brick. The enameled bricks to be built in with the construction, and to be

sufficiently weatherproof and protected to be in perfect condition on completion of building.

Arches.

214. Openings to elevator wells at each floor to have enameled bricks ground to proper radius to neatly fit shape of arch as shown.

Vitrified Brick.

215. Panels of platform at east entrance of Laboratory A to be of dark-red square-edged vitrified paving brick, laid on edge in herringbone pattern, with border. Bricks to be laid on bed of 18 inches of dry furnace clinkers and 4-inch bed of concrete, with 1-inch bed of dry sand.

STONWORK.

General.

216. Proposals are required upon various white American marbles and gray (or white) and pink granites for the superstructure of the building, and particular attention is called to the stipulations herein as to capacity and development of quarries, quality of material, and workmanship. The buildings to which this specification relates require work of the first class, and the penalties for failure to furnish such will be strictly imposed.

Selection of Stone.

217. In the selection of stone, the architects and the Department will consider desirability and fitness, financial and business standing of quarry owners, capacity of the quarries, facilities for cutting and shipment, as well as the item of cost, but such consideration shall not relieve the contractor of any responsibility.

Location of Quarries.

218. The name and location of quarries from which it is proposed to obtain each kind of stone upon which a bid is submitted, must be stated in the proposal; quarries must be fully opened and developed, and capable of producing without delay to the work, stone of the size and quality required.

Kinds of Cut Stone.

219. The cut and dressed stonework to be as hereinafter described.

Base of Building.

220. Whether it shall be finally decided to use marble or granite for the superstructure of the building, all outside steps, cheek blocks, platforms, doorsills (not otherwise specified), manhole covers, area copings, door and window sills in areas, and the entire base of building to grade 47 feet, or level of first floor, to be of approved gray or pink granite.

221. For this purpose a granite is desired of warm color, and of coarse texture or strongly mottled.

Face-stone Work.

222. The entire outside facing of all exterior walls above granite base (except certain portions shown and specified to be brick), all exterior columns, pilasters, cornices, balustrades, window and door casings, string and sill courses, parapets, sills and lintels in unfinished ends of wings, etc., to be approved white marble, or approved granite of white, light-gray, or light-pink color.

223. Each bidder shall submit proposals for at least three kinds of marble and three kinds of granite, and give the name and location of the quarries from which the stone is proposed to be taken. (See proposal sheets.)

Quality of Stone.

224. All stone to be No. 1 selected stock, close-grained, and of even texture and color, free from all defects, iron stains, etc., of dimensions shown and required, and in every way acceptable to the supervising engineer and the architects.

225. Bidders will note that while an even texture and color is required, the variation in tone usual in first-class marble or granite is expected and desired, in order to give texture to the wall surfaces of the building. Such variation, however, shall not be caused by spots or discoloration, and shall at all times be subject to the approval of the architects through the supervising engineer.

Quality of Cutting.

226. It must be distinctly understood that the quality of workmanship on all stone is to be first-class in every respect, and defective work of any kind, whether in such position that it will be concealed or not, may be rejected irrespective of any local or trade customs.

Guarantee.

227. The contractor shall absolutely guarantee all stone furnished by him and replace any that may show cracks, spots, or other defects, whether these defects are discovered after the stone is in the wall or not, and this obligation shall hold good for one year from completion of contract, nor shall any plea that the kind of stone was selected by the United States from the several varieties submitted be accepted in justification of any defects therein.

228. In case stones in the wall must be replaced under the above requirements, the contractor shall be responsible for the cost of removing and replacing or repairing any other work involved or necessarily displaced or injured thereby, such other work to be done by the contractor furnishing the same, at the cost of the contractor furnishing the stone.

Seasoning.

229. All stone to be quarried a sufficient time before setting to thoroughly season, and during this time must be kept in a dry, heated place, or exposed to the sun and weather.

Finish.

230. For marble, all work to be finished square, drove-tooled surface, six bats to the inch.

231. For granite, steps are to be four-cut, ashlar and all work not otherwise specified to be six-cut, including rustication.

232. Soffits of openings, and other work where so directed, to be tooled at right angles to the face of walls, vertical work to be tooled vertically.

Coursed Ashlar.

233. The plain surfaces of all exterior walls, shown to be faced with marble or granite, to be of dressed and coursed ashlar, jointed and bedded as shown, and thoroughly bonded to brick backing, courses to be alternately 9 inches and $13\frac{1}{2}$ inches unless otherwise shown.

234. All stone must be of full size, so as not to diminish the bearing on the wall. Stones having a bearing less than that shown may be rejected, or else accepted at a reduced price, the deduction to be determined by charging \$3 per cubic foot for the missing stock.

Cut and Molded Work.

235. All cut and molded work to be profiled, jointed, and executed in strict accordance with the full-size drawings and models, and a failure to follow the exact contours as shown by details will be cause for rejection.

236. Molded and ornamental work must not be cut until the full-size model to be erected at the site has received the written approval of the architects.

237. Particular care is to be used in cutting the large engaged columns, and accurate entasis will be required.

Outside Steps.

238. Steps and platforms to have at least $\frac{1}{8}$ -inch wash to the foot, all to have proper bearing, and to be carefully bedded, and to be in one piece unless shown jointed.

239. Steps and platforms of main entrances to have ends butted against cheek stones with close and even joint.

Dry-well Caps.

240. In the capstones over dry wells holes are to be cut 2 feet in diameter and properly rebated to receive the ironwork of cover, and the capstones to be cut with draining grooves 2 by $\frac{1}{2}$ inch deep, encircling the opening and forming drain, the stones to be set with proper grade. These stones to be of same granite as shall be selected for outside steps.

Corner Stone.

241. Provide corner stone at northeast corner of building, where directed, with pocket and cast-bronze box 12 by 12 by 18 inches, same to be hermetically sealed when filled. Cut inscription on stone as directed.

Area Copings.

242. The area coping stones to be closely jointed and cramped together on the upper surface with cramps let into the stone $\frac{1}{2}$ inch below the surface, turning ends down 1 inch, packing the groove solid and flush with neat Portland cement, colored to match the stone.

Wash and Drip.

243. All stonework with exposed top, including copings, to be cut with wash, and all projecting work to be undercut for drip, the undercutting to be returned against building where required to avoid showing on end of the stone. Cut all necessary grooves in stonework to receive flashing, the same to be dovetailed $\frac{3}{8}$ by $1\frac{1}{2}$ inches except where otherwise shown or required. Cornice to be properly grooved to receive joint flashings as shown.

244. Door and window sills to be cut with wash and have seats for jambs, and to be bedded at the ends only.

Lewis Holes.

245. Lewis holes will be permitted only in center of stones and not on any exposed face.

Patching.

246. No patching or hiding of defects will be allowed, and no excuse will be accepted for nonobservance of this condition. All defective stone or work will be unconditionally rejected.

Beds and Joints.

247. All stone to be set on the natural or quarry bed unless otherwise directed.

248. The beds and joints of the stonework to be fair, true, and out of wind, to have equal bearing throughout, and to be so worked that when set the exposed joints will be $\frac{1}{4}$ inch in thickness, and the stone to be set with the exposed joints open 1 inch back from face for pointing. This must be done by raking out the mortar before it has set.

249. This raking out is to be done with extreme care, and bidders will note that the penalties herein provided under "Guarantee" will be rigidly enforced in the case of spalled edges.

250. All the stonework to be pitched off at back so as to be square with beds, and all stone against which wood or iron will abut, to be finished to an even surface.

251. The beds, backs, and ends of all marble, if same is adopted for facing, to be thoroughly painted before setting, with an approved waterproof paint.

252. Each stone to be the full size required by the drawings: distance lines showing from joint to joint are from center to center, stone to be cut accordingly, allowing for joint of required width.

Reveals.

253. All reveals to be made without vertical joints unless otherwise shown; stone to be run back from face of wall to full depth of reveal.

Internal Angles.

254. Internal angles to be cut from the solid, unless otherwise shown.

Washing.

255. Each stone to be washed clean before setting, and no mortar beds to be laid until the under stone, concrete, or brickwork has been washed clean.

Mortar for Stone Setting.

256. Mortar for stone setting to be 1 full part of Lafarge non-staining cement to 2 parts sand and $\frac{1}{4}$ part approved lime paste. Lime paste to be best quality well-burned quicklime slaked and handled as hereinbefore specified, or as the supervising engineer may direct. All to be mixed with the proper proportion of clean water. Hydrated lime may be substituted for lime paste, as specified for brick work.

257. Mortar to be machine-mixed in the same manner and subject to the same restrictions as that specified for mortar used in brick masonry. Only the quantity of mortar required for one hour's use shall be mixed at one time, and no mortar to be used after the first set.

258. If stone setting is done in freezing weather, the stone and mortar must be heated and protected in the same general manner as specified for brickwork, and the contractor must assume all risk of damaged work due to freezing in any case.

259. Sand for mortar to be thoroughly washed and as specified for brickwork, special care being taken to exclude by proper screening all pebbles and material too coarse for good work.

260. Stone setters are to be constantly supplied with water for tempering mortar, and no mortar to be used for any purpose in this work unless the same has been properly tempered.

Setting.

261. All stonework to be set with proper derricks, and no pinch-bar work will be allowed. The stone must be carefully bedded, and both vertical and horizontal joints must be thoroughly filled with mortar from face to backing by calking if necessary. When stone is set and mortar raked out of face joints to the depth specified for pointing, all mortar and dirt shall be removed from exposed surfaces of stone.

Course Diagrams.

262. The contractor will be required to furnish the supervising engineer complete course plans in triplicate of every course of stonework, showing size and shape and jointing of all the stone. No stone must be cut until the course plans have been approved, and no molded or carved stone shall be cut until the full-size model has been approved and the full-size details have been received. These course plans are to be considered shop drawings, and are subject to the same general provisions as shop drawings under "Steel and iron work."

Cramps, etc.

263. The contractor is to supply all the galvanized wrought-iron cramps and anchors shown and required, make all sinkages for same, thoroughly embed them in mortar and properly build them in. The ashlar and all molded work, such as window trims, string courses, etc., to have not less than two ties to each stone.

264. Anchors securing stone to backing to be not less than $1\frac{1}{4}$ by $\frac{1}{4}$ inch, bent into the stone at least $1\frac{1}{2}$ inches, to run at least 8 inches into backing and turned up or down $1\frac{1}{2}$ inches or more.

265. Wherever special cramps or anchors are required, they must be of approved shapes and sizes, and the contractor must, before ordering same, obtain the proper details therefor. Each stone of the door and window pediments and cornices must be anchored, and all overhanging cornice stones must be secured in an approved manner.

266. The dowels generally to be of $\frac{3}{4}$ by $\frac{3}{4}$ inch wrought iron; those for balusters to be of slate, of proper size, and in no case less than 2-inch cubes.

Cleaning and Pointing.

267. On the completion of the walls of the building, the exterior exposed stonework is to be washed down clean, and the joints raked out to a depth of 1 inch in addition to the raking at time of setting. The loose mortar must be brushed out, joints moistened with water, packed solid with nonstaining cement mortar as specified, finishing the joints slightly concave, weather surfaces to be pointed flush and all water-tight.

268. In cleaning down, vegetable-fiber brushes and clean water are to be used, no steel or other metal brushes being allowed unless specifically approved for use by the supervising engineer in certain cases. No acid may be used in this work unless the same be found absolutely necessary, and then only such kinds and of such strength as may be approved by the supervising engineer. After the use of acids, the stone must be thoroughly washed with clean water.

Carving.

269. All stone ornamentations shown on exterior, including columns and pilaster caps, corner drops of cornice, pediments, etc.,

all as shown on the various drawings, to be carved in a free, bold, and thoroughly artistic manner, in strict accordance with models and full-size details; to be well accented, subject to the approval and to the entire satisfaction of the architects.

Models.

270. Full-size plaster models are to be furnished by the contractor for all the work described in the preceding paragraph and sent to the building after their approval by the architects. Modeling to be done at Philadelphia, Pa., or Washington, D. C., as the architects may direct, that they may be studied under their personal supervision. The models required will be one full-size clay model of each different ornamental design, and as many plaster casts shall be made therefrom as are required for the suitable progress of the work.

271. The models are to be made from the details and in accordance with the instructions of the architects, and shall be changed, modified, remodeled, or recast as may be desired, previous to final approval. Plaster casts shall be colored and hoisted to position in the building and firmly secured in place, if so directed, for the inspection of the architects before approval.

272. In addition to the models for ornamentation, the contractor is to erect the necessary framework and provide a model, full size, of a section of the entire face of the building, 20 feet wide, extending from the terrace line up to and including the cornice and balustrade. Section to be taken at the junction of a pavilion with the main wall (front wall) of the building. This model is to be made at the studio of the artist and casts taken therefrom and set up in position on the framework above specified, at the height and in the position to be occupied by the completed stonework, and the surface is to be colored, if so directed, to match the coloring of the same, and all necessary facilities to be afforded to the architects for examination of these models, and such modifications in them as may be desired are to be made without additional charge.

273. This model to be made and erected as soon as possible after award of contract, as full-size details for ornamental and molded work will be subject to revision by the architects, until this full-size model has been approved.

274. Flat or modeled surfaces may be put in place at the building instead of casting in studio. Models and the supports for same are to be substantially constructed, and every care is to be taken to avoid accidents of any kind during the maintenance of same in position. Model is to be removed when so directed by the supervising engineer.

275. A separate price must be named in the bids for this full-size model of the face of the building. It may or may not be required. If not required, it will not be paid for.

276. Only the highest class of workmanship will be accepted for the above models, and the modeler or modelers employed for this work must be selected by or be satisfactory to the architects, who will be the sole judges as to the character of the work.

277. All expense connected with the models, or incident to examination, handling, and approval of same is to be borne by the contractor.

Samples for Selection.

278. Each bidder shall submit with his proposal properly labeled samples of the various kinds of stone upon which his bids are based. Samples to be 6-inch cubes, finished to show rock face and the various finishes specified for the finished building.

279. Where producers of certain stone furnish estimates to more than one general contractor, one sample of such stone will be sufficient, but it must be properly marked for identification, and be referred to by the different bidders in their proposals.

Samples for Quality.

280. After the selection of material for the facing of the building the contractor is to erect an approved sample at the building, at least 8 feet wide and 10 feet high, of stones equaling the average size of those used in the building, and representing the average conditions as to marking, veining, or other peculiarities of the stone of the best grade produced by the quarries. The sample is to be similar to a section of the exterior wall of the building and is to include part base and part superstructure, as may be directed. It is to be set in cement, to be backed with brick, and left in place until the completion of the stonework as an approved standard of workmanship and showing the variation of color permitted.

281. The sample is also to show the method and character of cutting for inspection and approval. If surfaces as cut are not satisfactory, they shall be recut until approved samples are obtained.

282. After the approval of character of cut surfaces of stone are set up, the contractor shall prepare smaller samples in triplicate, which shall not be less than 3 square feet of each separate kind of cutting required, including exposed surfaces, bedding, and butts. After the completion of these smaller samples in a manner satisfactory to the supervising engineer and the architects, one of each of the samples will be retained by the supervising engineer at the site, one be shipped to the architects, and the third to the quarries, as the standard of cutting to be followed throughout the work.

ROUGH TERRA COTTA.

Quality.

283. All terra cotta except flue linings to be best quality hollow, porous, molded fair and true, evenly burned, unwarped, free from large kiln cracks and defects, and each piece roughly scored before burning to afford suitable key for plaster.

284. Terra cotta flue linings to be vitrified, and of equal quality.

Clay.

285. Terra cotta must be made from a tough, refractory clay and be so burned as to produce a tough, strong material. It shall not be brittle and must be capable of enduring a high temperature without melting, and considerable temperature strains without fracture.

Shapes.

286. The usual commercial tile and skewback shapes will not be accepted, specially heavy blocks being required. No webs in floor tiles to be less than $1\frac{1}{4}$ inches thick, and in furring blocks to be not less than 1 inch thick.

287. Flue linings to be as shown by detail drawings.

288. No terra cotta except flues to be set until the roof covering is in place, unless specially authorized in writing by the supervising engineer.

Bedding and Jointing.

289. All terra cotta work must be bedded and jointed in Portland cement mortar as specified, with joints not exceeding $\frac{3}{8}$ inch in thickness. All blocks to be set in flat mortar beds and properly wetted before placed. Metal clamps, slips, anchors, and ties must be extra heavy wrought iron, and thoroughly coated with asphalt.

290. These clamps, etc., must be furnished and set by this contractor, wherever necessary to make a strong and thoroughly workmanlike job.

Terra Cotta Furring.

291. All exposed exterior walls above subbasement to be furred on inside face as shown on plans, with 2-inch approved porous terra cotta furring tile fastened and secured in the best manner with heavy copper wire to the anchors already built in. Any additional anchors or clamps required are to be furnished and put up by this contractor.

292. All tile furring and fireproofing work is to be done in the best manner and set in Portland cement mortar, particular care being given to the covering of all chases where shown to be so covered, with openings where shown.

293. Form proper terra cotta backing for all marble wainscoting and base courses, where same may be required.

Terra Cotta Floors and Beam Covering (Alternate).

294. An alternate estimate is required for terra cotta floor construction for all floors in the building (except for the subbasement floor), the ceiling of fourth story and all roofs to remain of cement and metal construction as herein specified.

295. Arches to be approved model, side construction, the soffit line 2 inches below the bottom flanges of beams, angles, channels, etc., with the skewback jointing on center of the soffits of the steel framing so that the same will be completely covered. All exposed portions of beams, etc., in subbasement to be covered also.

296. Where the drawings show haunch construction, terra cotta arches may be 12 inches deep for largest spans, and 10 inches deep for 6-foot spans, and 9 inches deep for less spans, skewbacks to be of proper additional depth to cover beams.

297. Should terra cotta arch construction increase the weight of floors over that shown, the weight of framing and strength of supports must be correspondingly increased, as directed by the supervising engineer. Any extra steel will be paid for at a pound price to be named separately in the bid.

298. The terra cotta arches must be capable of sustaining a weight of 600 pounds per square foot without sign of failure before sleeper filling is placed as specified for cement and metal construction.

299. Tests will be made as often as necessary by loading an entire arch, or a free section of an arch, with the specified load per square foot, uniformly distributed. These tests must be made by the contractor in a manner satisfactory to the supervising engineer.

300. The arches must be built on proper centers with sufficient camber, jointed in Portland cement mortar, and no joints must exceed $\frac{3}{8}$ inch thickness. All joints must be absolutely full of mortar.

301. Exposed portions of girders in subbasement and stories above the same to be fireproofed with terra cotta covering, using special forms where necessary.

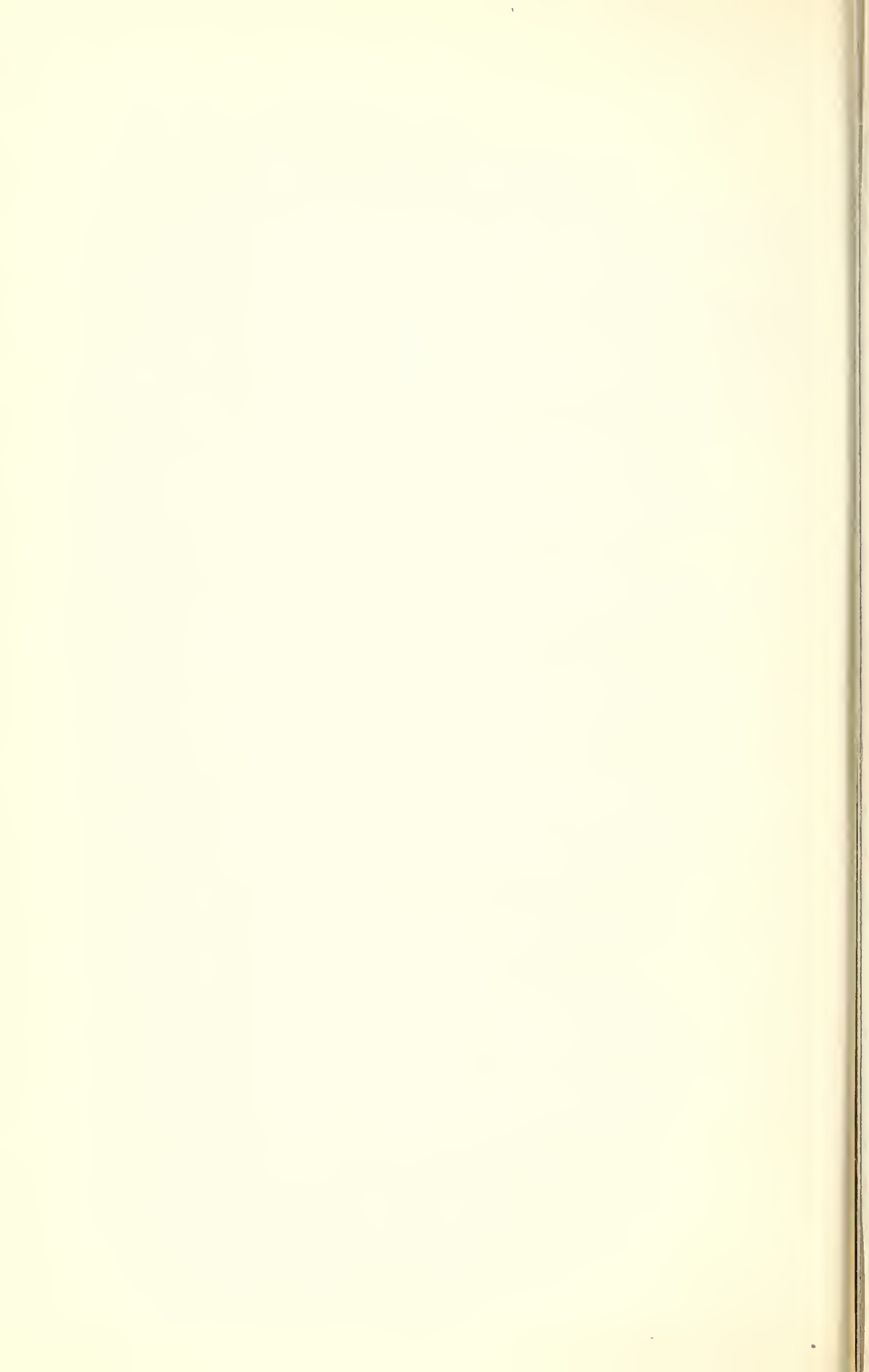
302. The minimum covering that will be accepted will be $2\frac{1}{2}$ inches of solid porous terra cotta, equal to samples which may be seen at the Department of Agriculture.

303. The terra cotta to be substantially secured in place in the best manner, with 1 by $\frac{1}{8}$ inch flat-iron straps built in around beams about 5 feet apart; such straps, if used, must be turned in over the lower flange and up against the web of the beam or girder so as to have a secure anchorage in the fireproof covering.

Skewbacks for Brick Arches (Alternate).

304. Should alternate for brick arch floors be accepted, terra cotta skewbacks will be required and are to be included.

305. They are to be specially heavy, made of solid porous terra cotta having a minimum thickness of $1\frac{1}{2}$ inches. Clay for the same to be specially selected, tough, and refractory. They are to be so designed and so set that the thrust of the arch will cause no strain on the protecting flange of the skewback, and so placed on the beams that the joints when they come together will be filled full of Portland cement mortar.



STEEL AND IRON WORK.

Quality of Steel.

306. All steel must be of open-hearth steel of approved manufacture, having an ultimate strength in tension of from 60,000 to 68,000 pounds to the square inch, elastic limit not less than 60 per cent of the ultimate strength in tension, minimum elongation of 24 per cent in 8 inches, minimum reduction of area at fracture of 40 per cent, and to be bent cold through 180 degrees on diameter equal to the thickness of the test piece without showing a crack or flaw on the outside of the bent portion.

307. Any rolled shapes which are $2\frac{1}{2}$ per cent light will be rejected.

308. All rivets to be of rivet steel having a tensile strength of 50,000 to 58,000 pounds to the square inch, and it must be capable of being bent cold on itself and flattened without a sign of fracture or flaw.

309. The tensile strength, limit of elasticity and ductility shall be determined on standard test pieces, cut from the finished material and turned or planed parallel, the pieces to have not less than $\frac{1}{2}$ square inch of sectional area, the elongation to be measured on an original length of 8 inches.

310. The contractor must furnish the number of test pieces required, and no material is to be shipped or riveted up until it has been inspected, tested, and approved by the duly accredited inspector herein provided for.

Quality of Cast Iron.

311. Cast iron to be best quality tough gray iron, sound and clean, free from defects, cracks, cold shuts, or bubbles, smooth-finished, and true to the pattern. Molded and ornamented work must be fine stove castings, sharp and clean, joints dressed to a close fit, exposed cross joints lapped flush, and holes in cast iron for bolts, etc., must be drilled. The material shall be of such strength that a bar 1 inch square and 5 feet long, cast in a separate mold, will sustain as a beam a load of 150 pounds placed midway between supports $4\frac{1}{2}$ feet apart. When a rectangular corner is struck with a hammer it must show an indentation without chipping off.

Quality of Forged-iron Work.

312. Ornamental wrought-iron work to be hand-forged, smooth-finished, the parts welded where required, and rivets to have counter-sunk or cup heads as directed. Welding to be clean and perfect and workmanship to be in every way first-class.

Models.

313. Models are to be submitted for all ornamentation in cast and wrought iron as specified for stone ornamentation under "Exterior stonework." Photographs in triplicate of all ornamental grille work are to be submitted to the architects for approval before the work leaves the shop.

Shop Drawings.

314. The contractor will not be permitted to work by the drawings furnished by the architects, but must provide his own shop drawings for both structural and ornamental work, triplicate copies of which must be furnished the supervising engineer before any of the work shown thereon is executed; two copies to be retained and the other returned to the contractor with the approval of the architects and the supervising engineer, or with such corrections as may be found necessary to accord with the specifications or as may be required by first-class workmanship. Should extensive changes be needed, new drawings shall be submitted.

315. The contractor shall not make in the shop drawings any deviations from the contract drawings without the express written permission of the supervising engineer, and the supervising engineer shall have power to require the contractor to replace any work done in violation of this provision.

316. It must be distinctly understood that neither the architects, the United States, nor any of its representatives, shall be held to any responsibility whatever for errors in these shop drawings which the examination and scrutiny of the architects or the supervising engineer may have failed to detect, and the contractor is to be absolutely responsible for the correctness of drawings furnished by him.

317. Wherever the expression "similar" is applied to iron or steel work on the drawings or in the specifications, it must be taken in its general sense and not necessarily as identical, and each member must be worked out separately with due reference to the floor plans and details, and the requirements of the same.

318. Any material riveted up before the approval of the shop drawings and the acceptance of the materials will be at the contractor's risk, and no inspection or approval of work or material at the shop or elsewhere shall preclude rejection if the same be found unsuitable at the building.

Markings.

319. All the girders, floor ceiling, and roof beams to have a distinguishing mark, plainly marked thereon, near one end.

Inspection.

320. The shop, mill, and field inspection of all structural metal work shall be done by an inspector or inspecting company approved

by the supervising engineer, the entire cost of such inspection to be paid for by the contractor, and for which he shall allow in his proposal the sum of \$1 per ton.

321. Should the supervising engineer secure the services of proper inspectors for less than this, the saving shall be deducted from payments due the contractor.

322. Ample facilities shall at all times be furnished the duly authorized inspector at the mill, shop, and building for inspection of material, and the finished pieces must not in any case be painted or oiled before being accepted at the shop.

Painting Ironwork.

323. All the structural steel and iron work, after inspection by the inspector herein provided for, and before leaving the shop, to be cleaned of all scales, rust, etc., and given one coat of pure linseed oil. Where pieces are in contact, each surface to be given one coat of pure linseed oil and best quality of red lead before assembling. One pound of oil to be used to $3\frac{3}{4}$ pounds of red lead. After erection, the entire steel and iron construction to be painted two coats of red-lead and linseed-oil paint of different shades, 1 pound of oil being used with 4 pounds of red lead and 2 ounces of japan drier. All parts inaccessible after erection to be given at the building, and before being put in place, two coats of paint similar to that above specified.

324. All planed and turned surfaces, drilled holes, etc., to have a coat of white lead and tallow immediately after turning, planing, etc.

Workmanship.

325. All the workmanship to be first-class in every respect, and in the inspection, special attention will be given to this requirement. All joints at splices, unless otherwise noted on the drawings, must be planed so as to give close bearing throughout.

326. Rivet holes at splices must be laid off and punched so accurately that the holes will come exactly opposite when members are brought into position for riveting.

327. Rivets must completely fill the holes and have full heads concentric with rivets and the head must have full bearing on the plate. All rivets to be driven with a machine capable of retaining pressure after upsetting rivets. Hand-driven rivets will only be permitted where a machine can not be used.

328. All holes in materials $\frac{5}{8}$ inch thick or less may be punched full size, holes in all material over $\frac{5}{8}$ inch thick must be punched $\frac{1}{8}$ inch small and reamed to full size, or the holes may be drilled.

329. The diameter of the punch shall not exceed the diameter of the rivet; and the diameter of the die shall not exceed the diameter of the punch by more than $\frac{1}{16}$ inch.

330. Drift pins must only be used for bringing the pieces together in assembling and they must not be driven so hard as to distort the metal. When holes need enlarging, it must be done by reaming.

331. Built members when finished must be absolutely free from twists, open joints, or other defects.

332. Steel which has been partially heated must afterward be wholly annealed.

333. Exposed heads of bolts and screws in ornamental ironwork must be countersunk (except as otherwise shown), completely fill the holes, and be flush with face of work.

Framing, etc.

334. The contractor must furnish and put in place complete all the steel and iron work shown on the drawings and called for by the specifications, or required to carry out the construction as shown by them, for whatever system of construction may be finally decided upon and adopted.

335. The framing is fully shown and noted on the drawings and must be in strict accordance therewith, connections generally to be made with angles, etc., using bolts and rivets of the number and sizes shown and noted, and where not noted, connections to be standard, and made with rivets, but where it is impracticable to rivet, bolts $\frac{1}{8}$ inch greater in diameter may be used. Where bolts are used, nuts must be drawn tight and secured by upsetting threads with a chisel.

336. If any form of arched fireproof floor be adopted, floor beams are to be provided with tie-rods as directed, same to have nuts and washers and to be properly tightened.

Separators.

337. Cast-iron separators of standard shape, fitting the profiles of beams forming girders, to be placed where shown on plans and as called for by note on the several drawings. The beams to be bolted through the separators with bolts of required diameters, none to be less than $\frac{3}{4}$ inch.

Wall Plates and Bearings.

338. All beams and channels resting on walls and not shown to have special plate, to have rolled steel bearing plates, as follows:

7 and 8 inch beams, 8-inch bearing, 8 by 8 by $\frac{3}{4}$ inch plates.

9 and 10 inch beams, 8-inch bearing, 8 by 12 by $\frac{3}{4}$ inch plates.

12-inch beams, 12-inch bearing, 12 by 12 by $\frac{3}{4}$ inch plates.

15-inch beams, 12-inch bearing, 12 by 16 by $\frac{3}{4}$ inch plates.

18, 20, and 24 inch beams, 16-inch bearing, 16 by 16 by 1 inch plates.

339. Girders and beams used as girders to have plates as shown or in proportion to those above specified. Certain beams and girders on a

slope to have cast-iron plates properly beveled to secure an even bearing, with girders securely bolted to same.

340. All girders and roof beams, and each alternate beam of each floor to have $\frac{3}{4}$ -inch wall anchors of approved pattern. All leveling up to be done with steel or iron plate fillers.

341. Every roof beam must be tied down with a $\frac{3}{4}$ -inch round rod, bedded at least 3 feet deep in the wall below.

Skewbacks.

342. Channel skewbacks to be placed against brick walls, and be fastened with 6 by $\frac{3}{4}$ inch expansion bolts, spaced about 4 feet on centers. Bolts, 8 by $\frac{3}{4}$ inch, built into the walls, may be used in lieu of the above expansion bolts in cases where channels, etc., are placed before the brickwork is built.

Lintels.

343. Lintels over openings to be as shown and noted on the drawings, all to have cast-iron standard separators, bolts for the same being $\frac{3}{4}$ inch in diameter.

344. Openings for heat and vent registers in brick walls to have lintels of angles as shown by detail.

345. Paneled recesses in corridor walls to have similar lintels.

346. All square head openings in interior brick or stone walls, including openings where flues or ducts carry through walls, not shown with beam lintels, to have lintels formed of channels set with flanges up, of proper depth to cover full thickness of walls and 1 foot longer than width of opening.

347. Openings in exterior walls not otherwise shown or specified, to have lintels formed of two 6 by 4 inch angles securely bolted together. The Felton Steel Tension lintel may be used in place of these angle lintels, where suitable.

False Ceilings.

348. The fourth-story ceilings of stair halls in west end of Laboratory A and east end of Laboratory B are to be furred down, and proper framing is to be provided as shown.

Ladders.

349. The ladders indicated at various points on roof to be constructed of wrought iron, with $2\frac{1}{2}$ by $\frac{1}{2}$ inch flat bars, properly bent at the ends, and securely bolted to walls below, at top ladders to extend 2 feet 6 inches above roof, and bent ends are to be secured in the best manner. The rungs are to be of round bars about 18 inches long, $\frac{3}{4}$ inch in diameter, shouldered $\frac{1}{2}$ inch and headed through the side bars and forged secure, spacing rungs as shown.

350. Ladders in subbasement, and fourth floor to attic (of each laboratory building) to be similarly constructed.

Exterior Light Brackets.

351. The two brackets at the east entrance of Laboratory A, and west entrance of Laboratory B, to be of cast bronze metal, and fitted with globes, etc., and wired for connection with general lighting system, complete. A full-size model of these brackets to be submitted to the architects for approval.

Window Grilles.

352. Grilles for exterior basement windows to be as shown, electro-bronzed. Each grille to be hung on two 1-inch square lugs, let 3 inches into dovetail-shaped holes in the jambs and packed solid and flush with lead, and to be secured to a similar lug by a heavy approved lock.

Door Grilles.

353. Grilles to doors 81 and 82 in both laboratory buildings to be as shown, and electro-bronzed.

354. All gates to have suitable heavy hinges and locks with duplicate keys.

Elevator Inclosures.

355. Elevator gates and grilles to be as shown, gates to have approved hangers and catch, all to be electro-bronzed.

Vestibule Door Frames.

356. Inside vestibule door frames to be built up of cast iron suitably reinforced, electro-bronzed and properly rebated for doors and glass.

Stair Railings.

357. Main stairs from subbasement to fourth floor to be constructed of stone as specified under "Interior marble work."

358. The balustrade is to be of wrought and cast iron, molded and ornamented as shown, in the best and most artistic manner, according to full-size details to be hereafter provided, and is to carry across windows as shown.

359. The core rail of balustrade to be $\frac{1}{2}$ by 2 inch wrought-iron bars, firmly fastened to newel posts, etc., and correctly curved as shown, to follow line of stairs.

360. The balustrade to have white oak 3 by $3\frac{1}{2}$ inch hand rail as shown and hereinafter specified, neatly fitted to newel posts, etc., and secured to core rail by $\frac{1}{4}$ -inch-diameter screws set in from under-side about 2 feet apart.

361. All ironwork of stairs is to be finished in electro-bronze.

Area Railings.

362. All pipe railings shown in connection with outside areas are to be 3-inch outside diameter, to be fastened together with coup-

lings and bosses of approved design, and screw joints. Rails to be secured to masonry by $\frac{3}{4}$ by 4 inch expansion bolts. Finish to be electro-bronze.

Iron Stairs.

363. The stairways from fourth floor to attic are to be of fire-escape construction, with perforated cast-iron treads (no risers), at least $\frac{1}{2}$ inch thick, bolted to cast-iron wall strings on wall side and to 6-inch light channels on the other side, using $\frac{3}{8}$ -inch bolts. Railing to be of galvanized-iron 2-inch outside pipe with uprights of same pipe and approved couplings and bosses, properly secured. All portions of stairways not galvanized to be neatly finished for painting by painter.

Fire Escapes.

364. Fire escapes to be as shown, constructed of 6-inch channels, and generally similar to stairs above specified. Shop drawings are to be submitted for approval before the work is executed.

Alternate.

365. Contractor is to name in his proposal sheet the amount he will add or deduct from his bid for substituting for the fire escapes, as shown, a patented, circular, sheet-metal fire escape, known as the Kirker-Bender type, one for each laboratory. Shop drawing showing just what is proposed must be submitted with the proposal. These fire escapes, if used, must be located within the building, at the south end of the corridors of the wings, and covered in with 4 inches of brickwork. They must deliver passengers on the ground, outside of the building.

Wire Screens.

366. The three outside openings in each fan room to have No. 8 galvanized-wire screens $1\frac{1}{2}$ -inch mesh, set in heavy galvanized-iron channel frames properly hinged, and provided with proper hasps and padlocks.

367. Above each ceiling light over staircases there is to be a screen of No. 16 galvanized wire $\frac{1}{2}$ -inch mesh, with heavy channel frame and stiffeners. Screen to be of full size of ceiling light, securely set and properly braced.

Painting of Stair Work.

368. Finish of oak hand rails is specified hereinafter under "Painting." All stairs, railings, ladders, etc., to be painted as specified for other ironwork, except where specified to be electro-plated or galvanized.

Shop Drawings of Stair Work.

369. Shop drawings showing detailed construction of all stairs to be submitted to the supervising engineer for approval before the work is proceeded with, as specified herein under "Shop drawings."

Gratings.

370. Heavy iron gratings to be provided and set as indicated over area at east entrance of Laboratory A and west entrance of Laboratory B.

Dry Well Covers.

371. Covers for dry wells shown to be of cast-iron $\frac{3}{4}$ -inch frame and 24 inches diameter, $\frac{5}{8}$ inch thick manhole door.

Painting of Miscellaneous Ironwork.

372. All ironwork (other than structural, which is hereinbefore specified) occurring in subbasement, loft, pipe shafts, etc., to be painted by this contractor as specified for "Structural iron and steel," unless the same be galvanized, bronzed, japanned, etc. All exposed ironwork in finished portions of building, unless finished as above stated, to have one coat of oil and one coat of red lead, as specified for "Structural iron and steel," ready for final painting by painter. The painting and oiling herein specified is to be included in this contract.

Electro-bronze.

373. Where electro-bronze or electro-bronze copperplate finish is mentioned in this specification it is to be the best electro-bronze copperplated work of color selected and of clean finish. Thickness of plating to be not less than $\frac{1}{16}$ inch for outside work, and $\frac{1}{32}$ inch for inside work.

Alternate for Bronze Metal.

374. An alternate proposal is required for furnishing all door grilles, elevator inclosures, stair railings, etc., of solid wrought and cast bronze instead of electro-bronzed iron. Basement-window grilles and area railings to remain electro-bronzed iron.

CEMENT-FLOOR CONSTRUCTION.

General.

375. Consideration will be given to a floor system of concrete-slab construction carried on steel beams and as hereinafter specified. Proposals will also be taken on a system of reinforced concrete construction without the general use of steel beams, as shown and hereinafter specified. Lump sum bids are to include the former system.

Finish.

376. The underside of all floors showing in the story below to be finished rough for plastering, unless otherwise specified.

377. All roofs to be of same general construction as the floors. Surface of roof construction is to be shaped and graded with proper pitch, gutters formed and sloped to conductors, the top of concrete work to be brought to an even surface with uniform grade and without holes, ready for the laying of roofing.

Floor Slabs.

378. The floor slab for the layout of steel beams shown shall be of concrete with a total thickness of $4\frac{1}{2}$ inches. For the 7-foot span it must have steel reinforcement amounting to 0.52 of a square inch of steel for every foot in width of the slab. For the 6-foot spans, it must have not less than 0.42 of a square inch of steel for each foot in width of the slab. By "width" is meant the dimension parallel to the steel **I** beams. The steel must be placed with its center at a distance of $2\frac{3}{4}$ inches from the top of the slab and should be in the form of small round bars. The slab shall be reinforced in a direction parallel to the steel beams by round steel bars $\frac{1}{4}$ inch thick, spaced 15 inches on centers.

379. The reinforcing bars running at right angles to the beams should be bent so as to rise to about the middle of the slab where they pass over the top of the steel **I** beams. At least every other reinforcing bar must be continuous over the top of every steel **I** beam, except at the walls, where they will all be cut off.

380. The beams are to be protected by concrete, giving a minimum thickness of 2 inches below the flanges, and of an inch and a half, measured from the edges of the flanges. This covering is to be built solidly into the web of the beam, and is to be reinforced by U-shaped bars, made of round iron $\frac{1}{2}$ inch in diameter, spaced at intervals of about 1 foot. The upper ends of these U-shaped bars shall be bent over the nearest reinforcing bars in the floor slabs. The lower angles of the U's must carry longitudinal $\frac{3}{16}$ -inch round bars running parallel to the beams. The steel reinforcement of the concrete beam

covering is to occupy about a mid position between the outer surface of the concrete and the surface of the steel, where it passes around the lower flange. The stirrups need not be bent to conform to the profile of the **I** beam, but may be placed 1 inch up from the soffit of the beam protection and $\frac{3}{4}$ inch in from the sides.

381. Concrete for the slabs and beam protection described herein is to be formed of gravel, broken brick, or broken terra cotta. The aggregate may vary in size from grains of coarse sand to $\frac{3}{4}$ inch, but none is to be used that would fail to pass a $\frac{3}{4}$ -inch screen. The slab mixture is to be 1 part cement, $2\frac{1}{2}$ parts sand, and 6 parts aggregate. That for beam covering to be 1 part cement, 2 parts sand, and 5 parts aggregate, and made of specially small aggregate. The sand and aggregate for all concrete to be subject in every respect to the approval of the supervising engineer.

382. All concrete must be put in position rather wet or plastic, and every precaution taken to keep the forms and centers true, so that in finishing it will be necessary only to put on the white coat of plaster.

383. The floor slab must be spaced high enough to have at least 3 inches of its thickness on top of the **I** beams.

Reinforced Concrete (Alternate).

384. In lieu of steel beams and cement floor slabs, consideration will be given to floor systems designed entirely in reenforced concrete. A typical design, using a patented bar, is shown on drawing No. 274-62. There is no prejudice in favor of this particular bar, but reenforced concrete must, in all cases, be armored to at least the extent shown on the drawing. It must have inclined members similar to the sheared-up web members in the Kahn bar, set at an angle of 45 degrees with the horizontal, and rigidly fastened to the horizontal bars. These sheared members must be so proportioned that the total horizontal component of the adhesion of all of them in the concrete will be equal to the ultimate strength of the horizontal bar to which they are attached. In lieu of the Kahn bars, plain rectangular bars, with drilled holes and round rods put through these holes and bent to form U-shaped stirrups, will be accepted, but the net section of the rectangular bar must, in all cases, be equal to that shown for the Kahn bars in the drawing.

385. The contractor must particularly see to it that the United States is preserved harmless against claims for royalty in any reenforced concrete work.

386. All concrete floor construction must be executed strictly according to the drawings and the amount of concrete shown as fire protection to the steel reenforcement in the drawings must be regarded as a minimum.

387. All work must be smooth and true when finished. The centering must be made of dressed lumber and so accurately set that the exposed surface of the concrete will need only a floated coat of plaster of Paris for a finish. The centering must be rigid enough to prevent noticeable deflection of both girders and floor slabs.

388. The concrete must be made of Portland cement equal to that already specified for the work; coarse, clean sand, and clean gravel. The gravel must vary in size from a pea to a sphere an inch in diameter. Nothing will be accepted that will not pass a 1-inch screen. The proportions must be 1 of cement and $2\frac{1}{2}$ parts of sand to $5\frac{1}{2}$ or 6 of gravel, according to circumstances. Should it appear advisable to the supervising engineer, he may order reasonable variations in these proportions.

389. Wherever a girder is used, it must be made monolithic with the slab which rests upon it. In order to accomplish this, the work of filling the girder forms and the slab forms with concrete must be a continuous operation. In executing the work, a section across the entire building must be put in at one time. Where work is discontinued on one day the concrete slab must be finished on a line parallel to the reinforcement and extending from outer wall to outer wall. Joints in any other direction between the work of successive days will not be permitted.

Arch Filling.

390. The filling over floor arches or slabs and under all roof gutters where shown to be filled, and forming slope of roof where necessary, to be of concrete formed of 7 parts clinkers and ashes to 1 part cement. The under masonry must be well swept and drenched before laying concrete fillings. Filling to be thoroughly tamped so as to form a solid mass. If clinkers free of combustible matter can not be obtained, broken brick and sand may be used; any appreciable percentage of combustible matter will not be allowed.

391. Where wood floors are to be laid, this filling to be flush with top of wood sleepers. Where marble, terrazzo, cement, or mosaic floors are shown or specified, the filling to be an approved mixture containing sufficient additional cement to make a satisfactory and solid bed, and to be of proper depth to bring the finished floor up to required level.

Brick Floor Arch (Alternate).

392. An alternate proposal is required for a system of floor construction in the form of a segmental brick arch with the bricks set flatwise. Arches to be laid in the most careful manner, with close rubbed and pressed joints. Arches to have such a rise that the extradados in the center will be $1\frac{1}{2}$ inches above top of beams. Skewbacks to be of terra cotta, as hereinafter specified.

Haunch Filling.

393. Should brick-arch floor construction be adopted, the haunch filling over the same is to be of concrete similar to that specified for cement floor slabs. The filling is to be carefully placed and tamped to the satisfaction of the supervising engineer, and finished to a line 3 inches above the beams and $1\frac{1}{2}$ inches above the extrados of the arch in the center.

ROOFING.

Tile Roofing.

394. Roof of entire building, including wide gutter space behind balustrade, to be constructed as hereinbefore specified. similar to construction of floors in building.

395. After the concrete surface of the roof has been finished smooth and hard by the mason, the surface of the concrete is to be coated with hot asphaltic mastic and covered with five thicknesses of best quality approved asphalt roofing felt, laid shingle fashion with one-fifth the width of each sheet exposed to the weather; all laps to be thoroughly stuck and the upper surface of the felt coated with hot pitch. Upon the surface of the felt, running up and down the roofs at intervals of approximately $23\frac{1}{2}$ inches from center to center, the special ridge tile, as shown on detail, are to be laid in mortar composed of 3 parts of cement to 1 part of sand. The spaces between the ridge tile are to be covered with 6 by 9 by 1 inch vitrified roofing tile securely bedded in cement mortar the same as the ridge tile; all joints in the ridge tile to be carefully pointed and the joints in the flat tile to be thoroughly grouted with liquid grout, composed of 1 part sand and 1 of cement. The ridge tile is to be hollow and closed at both ends and to be at least 1 inch thick. Roofs between main buildings and wings, also wide gutter space behind balustrades, and other flat portions as shown, to be laid with flat tile as above specified, the ridge tiles in these cases to be omitted.

Asphalted Felt.

396. The bed for tile and cement to be at least five thicknesses, laid in the usual manner with lap well cemented together full width, of approved asphalt roofing felt which has been in successful use for such purpose in large work for not less than ten years.

Gutters.

397. Proper gutters are to be formed in the roof, and they are to be graded carefully to the drainpipes.

Copper and Lead Work.

398. All copper work, except where otherwise noted, to be hot-rolled, 16 ounces, untinned.

399. Flashings for roof to be 6-pound lead laid in the most careful manner and let into parapets, chimneys, copings, skylight corbs, etc., the general manner being shown on details, and as hereinafter specified.

400. The flashings against walls to be properly executed and cap-flashed, turning up the copper or lead not less than 8 inches against the wall, the cap flashing to be 6 inches wide calked into joints, wedged with lead and pointed flush with elastic cement. On slopes the cap flashing must be stepped.

401. Flashings and gutters (where the latter are not formed by the slope of the roof) are to be generally of 6-pound lead; where this can not be used for any reason, they are to be of copper as above specified.

402. Certain rain-water conductors where so shown, are to be of 16-ounce copper, carrying from upper roof to wide gutter space back of balustrades, same to be properly connected to roof gutters, and securely fastened to walls.

403. All joints in gutter linings, flashings, etc., to be double-locked (lead single-locked) with flat seams $\frac{3}{4}$ inch wide, thoroughly soldered water-tight, and the work thoroughly secured in the best manner.

Rain-water Inlets.

404. All rain-water pipes not otherwise shown to be inside and furnished by plumber.

405. The outlets from gutters to down pipes to be of 6-pound sheet lead, well shaped and enlarged to twice the size of pipe, properly jointed and soldered to gutter lining and brass ferrules of down pipes.

406. The inlets to be screened with No. 12 copper-wire basket grating soldered in place, and the work around inlets and joints at down pipes to be made water-tight.

Skylights.

407. The skylights are to be constructed of 16-ounce copper heavily reenforced, or an approved section of rolled iron or steel, in the most approved manner, of dimensions shown, and capped with 6-pound lead.

408. Each division must have proper condensation gutter and is to be filled with $\frac{1}{2}$ -inch-thick ribbed skylight glass with No. 18 galvanized-wire screen below. They must be absolutely out of wind and set without being strained into place. Glass in skylight must be bedded on $\frac{1}{16}$ -inch-thick best asphalt paper or in other approved manner.

409. The contractor must submit triplicate drawings of skylight work, showing the details of construction, for the approval of the supervising engineer, and a small full-size section of skylight division.

Guarantee.

410. The entire roof, including skylights, to be guaranteed water and snow tight for a period of three years from the completion and acceptance of the building, and all defects and all damage resulting therefrom, within that time, to be remedied by the contractor without additional cost to the United States.

Alternate.

411. Bidders will note that an alternate proposal is required for the omission of ribs, using the 6 by 9 inch tile throughout, except at ridges of roof and for hips, where the special tile will be retained.



GALVANIZED-IRON WORK.

General.

412. All galvanized-iron work to be No. 24 B. W. G., to be thoroughly painted one coat on both sides, except flue linings, which will be painted on outside, and on the inside back of all register openings.

413. Paint for all galvanized work to be "Galvanum" or best metallic paint.

Flue Linings.

414. Contractor to furnish and build in all toilet-vent and hot-air pipes, which are inclosed in the walls or other construction as shown by drawings, ready for the connection of registers and ducts, which will be furnished by the United States under another contract. The work is to be done in the best manner as shown by the details and securely braced and fastened to walls.

415. Copper cleats, as directed, four to each register, are to be provided for fastening all registers, both for heat and ventilation.

Inverted Hoods.

416. Each janitor's closet is to be ventilated through an opening for 8 by 12 inch register in the wall of adjacent vent shaft. Openings to be close to ceiling, and inverted galvanized-iron hoods are to be provided in shafts at each opening, and securely fastened to walls.



PLASTERING.

General.

417. The building is to be plastered throughout, above the sub-basement, and below attic, except where other finish is shown or specified or where it is specifically noted as omitted.

418. Ceilings throughout (except that of sub-basement, which will not be plastered) may be finished by white coating directly on the underside of the cement-floor construction, provided the cement work is sufficiently smooth.

419. In case of brick or terra cotta floor construction alternate, plastered ceilings must be three-coat work, similar to that on side walls.

420. Elevator wells are to be lined with enameled brick and are not to be plastered.

421. Where walls have wainscoting, baseboard, or similar finish, plastering to be carried down to the floor, but the last coat in such cases may be omitted.

Lathing.

422. Chases where shown in corridor walls must be covered with No. 24 B. W. G. expanded-metal lathing or other metal lath not less than No. 26 gauge, all coated to prevent rust and well fastened in place.

Wetting Walls.

423. All walls and ceilings to be swept clean and to be well drenched with water before plastering, as may be directed by the supervising engineer.

Workmanship.

424. All work is to be done in the best manner known to the trade and none other will be accepted.

425. Plastering is to follow the lines of floor construction where no other finish is specified and is to make up any unevenness or inaccuracy in the construction. Beams to be finished square as shown.

Plaster.

426. Plastering herein provided for is to be the best three-coat work; each coat must be perfectly dry before the next coat is applied.

427. Brown mortar is to be made of first-quality fresh lime, coarse sharp sand, and strong cattle hair, and the lime must be run through a sieve of not less than five meshes to the inch before using, and must

be used as soon as it is stiff enough to be worked, but it must be slaked at least ten days before using. Before the brown mortar is applied, it is to be gauged with Portland cement in the proportion of about 1 part cement to 4 parts of lime paste. The surface of the first coat shall be left as rough as possible after it is applied by being scratched with a broom or scratcher, so as to strengthen the adhesion of the second coat. When the first coat shall have thoroughly dried, it is to be covered with the second coat, mixed and gauged with Portland cement in the same manner. The surface of the second coat must be made true and even, flush with grounds and out of wind. All angles must be made straight and all walls plumb. When the mortar has become sufficiently set, the entire surface must be made compact by floating and all bumps or other imperfections removed. The surface is to be run so that the finishing coat will adhere properly.

428. The finishing coat is to be of lime putty mixed with clean white sand and gauged with plaster of Paris. This coat must be run on with sufficient force to bond it thoroughly to the second coat and must be troweled to an even, straight surface, free from chips, cracks, or other defects, and must have, on completion, a decided burnish. The lime from which the white mortar is to be made is to be run through a sieve of not less than ten meshes to the inch.

429. Hydrated lime, equal to that specified elsewhere in these specifications, may be used instead of ordinary lime, slaked at the building site, upon written approval by the supervising engineer.

Metal Corners.

430. All external vertical angles over wainscots or other plastered corners where not specified, to be rounded, to have approved heavy galvanized metal corner beads which are to be furnished and set by the plasterer. The plaster must come up accurately to these corner beads, and if any beads are out of line, or if for any reason the plasterer shall fail to carry out this provision, he shall, at his own cost, make the work right.

Round Corners.

431. All external angles, except those over wainscoting which are to be square, are to have rounded corners, and where corners carry to the floor, they must in all cases turn into the square 2 inches above top of washboard, square portion to have metal corners.

All door and window openings throughout, not otherwise shown, are to be finished without trim; the plastered corners to be rounded.

Alternate.

432. Bidders will note that under marble work, an alternate proposal is required omitting certain marble wainscot, jambs, etc., in which case finished plaster must be provided to take the place of marble, as specified in other cases.

Special Plaster (Alternate).

433. An alternate is required for using, in lieu of plaster previously specified, a special brand of hard plaster which must be delivered at the building in original packages ready for application after the addition of water. If any ingredients, however, such as sand, are obtainable of quality satisfactory to the supervising engineer in the vicinity of the work, such material may be used and mixed where directed by the manufacturer, but the finished material must be delivered by him to the contractor as above required, ready for use after the addition of the necessary water to thoroughly dampen the mass, and under no circumstances will the contractor be allowed to add any solid material.

434. The plaster must be of such nature that under any conditions the finished coat may be applied within twelve days from the starting of the first coat, without detriment to any portion of the work.

435. The bidder must state on the proposal sheet the brand, with name of maker and place of manufacture, of the hard plaster proposed to be used by him, which must be satisfactory in all respects, and if not acceptable, the contractor must submit another or other brands in lieu thereof which will be satisfactory to the supervising engineer. After the award of the contract, the sample required must show the quality of finished work, which must be equal to the best it is possible to obtain with the use of any hard plaster.

436. The plaster must be applied in accordance with the specification of the manufacturers which calls for the best quality of materials and finish for the work required and of such thickness as will leave all finished surfaces true, but not less than $\frac{3}{4}$ -inch grounds.



INTERIOR MARBLE.

Kinds of Marble.

437. Kinds of marble are either specified hereinafter or marked on the drawings, and where not particularly noted, must correspond with surrounding marble as marked or specified.

Wainscoting.

438. The two vestibules of both laboratories, and the two stair halls of both laboratories from basement to fourth story inclusive, are to be wainscoted as shown on details and other drawings with Vermont "American Pavonazzo." Wainscot to be $\frac{7}{8}$ inch thick with plain unmolded cap 4 by $1\frac{1}{4}$ inches.

439. All halls and corridors of basement, first, second, third, and fourth stories to have a similar wainscot of C. F. White Italian marble.

440. All corridor doors, elevator openings, openings separating various corridors, etc., to have plain unmolded trim, 4 by 2 inches, of same marble as wainscot.

441. All doors, windows, and other openings having marble trim are to have $\frac{7}{8}$ -inch marble jambs and soffit casings.

Alternate.

442. An alternate proposal is required giving the amount that will be deducted from the lump sum bids if all wainscoting, door and window architraves, door and window jambs, in corridor and staircase halls of both laboratories are omitted. If this alternate is accepted, marble base and window sills will be retained and finished plastering must be provided in lieu of marble wainscot.

Marble Floors.

443. Entrance vestibules to have gray Knoxville marble floors as shown. Terrazzo floors to have border and divisions as shown of gray Knoxville marble.

444. Wing vestibule of Laboratory B to have 2-inch gray Knoxville marble treads with nosing and $\frac{7}{8}$ -inch risers as shown on plan.

445. Floor tiles to be not less than $\frac{7}{8}$ inch thick, all to be carefully bedded in cement mortar, joints grouted, so that upon completion every tile shall be firm, secure, and solid when sounded.

446. Edges are to be rubbed so as to fit closely with even joints, marble to be sound, without injurious flaws, and surface of all tiles to be rubbed to a smooth dull surface.

Baseboards.

447. Where marble and terrazzo floors occur, and under marble facing or wainscot, there is to be in all cases a marble baseboard $1\frac{1}{4}$ inches thick, unless otherwise specified, the general character of which is shown on the various details and sections. Baseboard to be gray Knoxville.

Terrazzo Floors.

448. The floors of all toilet rooms and janitors' closets throughout the building, floors of all halls and corridors on all floors to be of terrazzo laid between marble borders and divisions, on concrete as specified for cement floor. Top surface to be laid immediately after concrete to be at least $\frac{1}{2}$ inch thick, and to be composed of equal parts of Portland cement and white marble chips thoroughly mixed. It shall be troweled and rolled to an even surface, and after setting rubbed to a smooth finish.

Main Staircase.

449. The main staircases at each end of buildings, running from the basement to the fourth floors, are to be of gray Knoxville marble, constructed and laid so as to be self-supporting. Each step and landing is to be of a single perfect piece of marble, with nosing and scotia, returning as shown, carefully fitted together and let into brick wall at least 4 inches. Base of wainscot to be gray Knoxville and to form skirting of stairways.

450. Treads, including nosing, to be rubbed surface, and all other exposed surface, including scotia and soffit of stairs, to be polished.

451. Holes are to be cut through the steps at proper intervals by means of which the balustrades will be secured.

452. Attention is called to the fact that while these self-supporting stairways present no structural difficulties, they require most careful and accurate work, and the contractor is cautioned to see that only such is furnished.

453. Stairways from basement to subbasement to be constructed of solid Knoxville marble, with plain sawed surface, without nosings, all as shown on detail drawings.

Alternate.

454. Bidders will note an alternate is required giving the amount that will be deducted if the marble stairs in both laboratories are omitted.

455. This alternate does not include the marble wainscot of stair halls or the railing of stairs, it being the intention, if this alternate is accepted, to later add to the contract stairs of another type.

Toilet Rooms.

456. Floors of all toilet rooms and janitors' closets to be of terrazzo as elsewhere specified.

457. Marble work of all toilet rooms to be gray Knoxville.

458. All toilet rooms and janitors' closets to have gray Knoxville marble wainscot, generally 7 feet high, same to be plain $\frac{7}{8}$ -inch with plain 4-inch cap projecting $\frac{1}{4}$ inch beyond face of die.

459. Base to have rounded internal angles as shown, cut from the solid.

460. Water-closet partitions to be generally $1\frac{1}{2}$ inches in thickness, 7 feet high, bottom to be 12 inches high from floor, and they are to be secured to partitions and uprights by heavy brass nickel-plated brackets at top, bottom, and center, as shown. Uprights to be 2 by 8 inches, securely bedded in floor; top crosspieces to be 2 by 6 inches, all to be of gray Knoxville marble.

461. Screen partitions to be of gray Knoxville marble, 2 inches thick, and to be secured to wainscot and uprights by heavy brass nickel-plated brackets, as specified for water-closet partitions, and to be stayed by heavy $1\frac{1}{2}$ -inch-diameter nickel-plated brass-pipe braces, with proper and substantial fittings.

462. Carpenter will hang water-closet doors, but contractor for marble work shall drill holes in his work for hinges, etc., at points located by carpenter.

463. Contractor for marble to erect paper holders and coat and hat hooks furnished by other contractor.

464. Urinal partitions to be 5 feet high and $1\frac{1}{8}$ inches thick, and secured to the $1\frac{1}{4}$ -inch backs at top and bottom by heavy nickel-plated brass brackets. Ends to be carried down to the floor and doweled.

465. Floor of urinals to be 2 inches thick, countersunk as shown, with seats cut for divisions.

466. Windows in toilet rooms to have 2-inch marble sills and $\frac{7}{8}$ -inch casings, cap of wainscot carrying around window to form trim. Doors of all toilet rooms to have trim formed by cap of wainscot carrying around, jamb casings to be $\frac{7}{8}$ inch.

Quality of Marble.

467. All marbles to be of the best quality, selected with care; defective veinings requiring perceptible patchings or waxing or improper matching will be cause for rejection. All marble for wainscot and partitions to be cut so that veining and marking generally shall run vertically in the finished work. Veining of architraves to run lengthwise of marble strips.

Finish of Marble.

468. Unless otherwise particularly noted, all marble surfaces are to be highly polished.

Jointing and Setting of Marble Work.

469. Marble work (except that of floors elsewhere specified) to be bedded and jointed in plaster of Paris, substantially secured in place with heavy galvanized-iron holdfasts, staples, bolts, etc., dowels in general to be $\frac{1}{4}$ -inch round copper, smaller size to be used only where this size can not be employed.

470. Joints to be finished fine rubbed and fitted close, square and exactly even.

471. Joints of all external angles and returns in wainscoting, jambs, piers, etc., to be constructed with mitered filleted corners, unless otherwise directed or shown.

472. Generally 2 inches is allowed for marble facing and the backing of the same. Where marble is to be finished on both sides, it must be the full thickness specified or shown.

473. The design and the dimensions of the jointing of the marble wainscoting, door, and window trims, etc., in corridors, stair halls, vestibules, etc., are in general shown on the drawings and portions not so shown must correspond with parts similarly located.

474. Where jointing is not indicated, baseboards, skirting, etc., to be in long lengths; jambs, straight architraves, and soffit linings of openings to be in one piece; die of wainscot to be in one piece in height, unless otherwise shown.

475. The sharp edges and angles shown on details must be retained and not injured by polishing.

476. The marble must be so selected that there will be no abrupt changes in the character of the veining; so far as possible, marble for each run to be cut from the same block, and matched in veined marble.

477. All windows throughout, including those in wainscoting or marble-faced walls, are to have 2-inch sills with rounded edge. Where these sills come in connection with plastered jambs and facings, the sills must be set before finished plastering. Sills for all toilet and other rooms to be of gray Knoxville; elsewhere to match marble of wainscot. Generally where openings occur in marble-faced walls, the jambs will be cased with marble.

478. Door openings in wainscot, unless otherwise shown, to have marble plinths of same height and marble as the base of the wainscot.

Thresholds.

479. All doors separating marble or terrazzo floors from wood floors, to have gray Knoxville marble thresholds 2 inches thick, properly beveled.

480. Thresholds forming finish at elevator openings to be 5 inches thick, and of gray Knoxville marble.

Shop Drawings.

481. The contractor will be required to submit drawings in triplicate, showing jointing, etc., of all marble work, and no work is to be executed until these drawings have been approved by the supervising engineer.

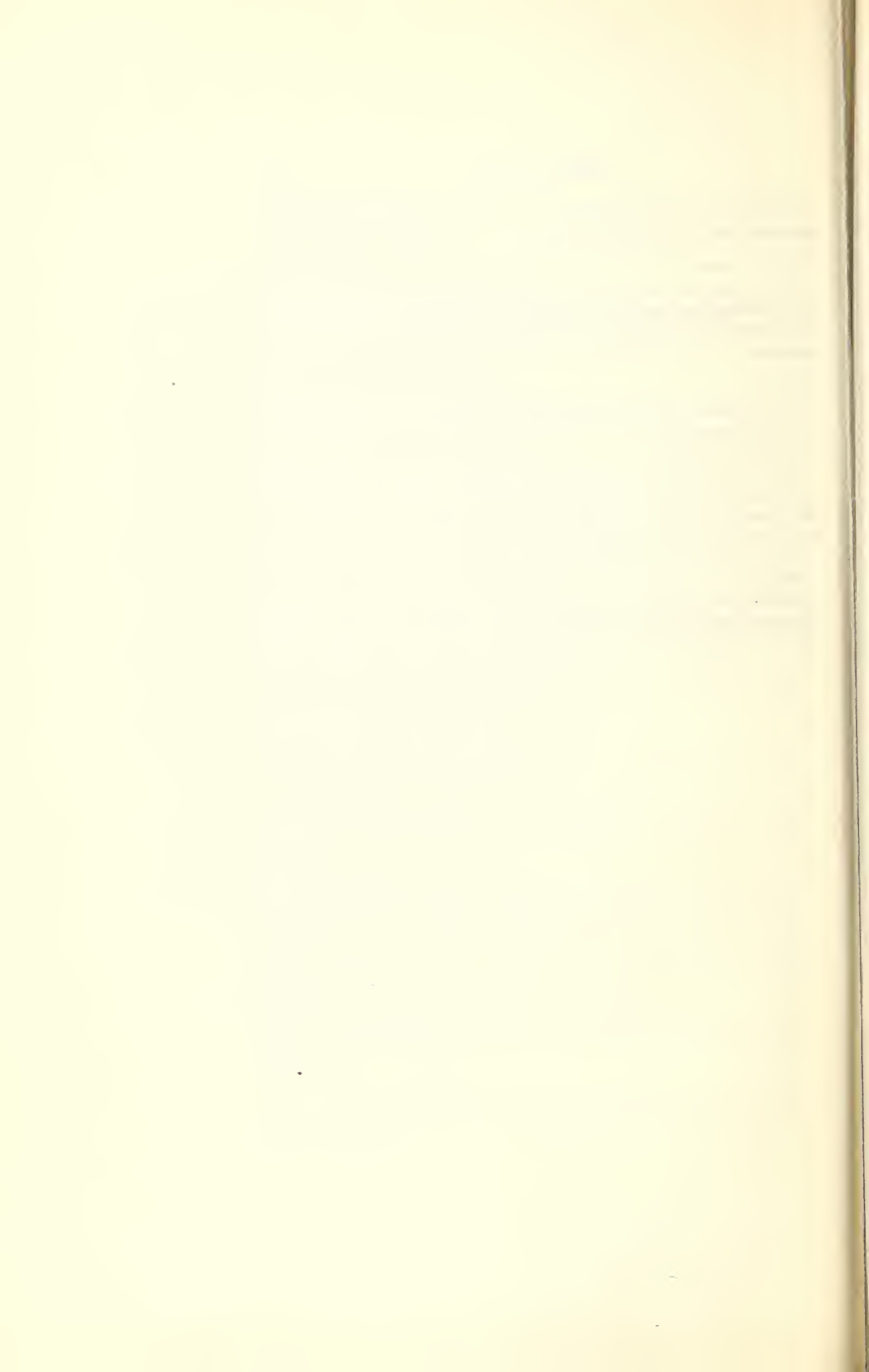
Samples.

482. Samples in triplicate of all interior marble, including metal work and fastenings, are to be submitted within six months of the date of this contract.

483. These samples are to be $\frac{1}{4}$ inch thick, 4 inches wide, and 8 inches long, and to be polished on one of the faces. In cases where these samples prove too small to show the character of the marble, larger samples must be submitted.

484. Should any samples be rejected, others shall be immediately submitted.

485. Finished work must be equal to the samples submitted, and the contractor should, where possible, submit samples taken from the blocks to be used.



CARPENTER WORK AND JOINERY.

Wood Framing, Blocking, etc.

486. All rough lumber to be the best mill-sawed, well seasoned, and free from defects; unless otherwise specified all rough lumber to be No. 1 Georgia heart yellow pine.

Wood Steps.

487. Construct temporary steps of heavy planks at west entrance of Laboratory B, as indicated.

Floor Strips.

488. Nailing strips for all wood floors to be cut from 2 by 6 inch yellow pine, unwarped, and free from large knots, ripped on a bevel of 1 inch, spaced 16 inches on centers, bedding the broad sides down into the concrete filling (which must be laid at one operation) with top of strips at the exact levels required to receive the flooring. The strips must be blocked upon the floor beams and arches and anchored by heavy expansion bolts.

House-tank Sleepers.

489. Furnish and set sleepers for house tanks specified under "Plumbing."

Flooring.

490. The floors of the entire building unless specified to be cement, marble, or terrazzo, to be finished with the best quality seasoned No. 1, 5-4-inch white maple of even color, face to be not over 2½ inches wide and edges to be properly tongued and grooved.

491. This flooring to be end-matched, hollow backed and punched for secret nailing at each sleeper. It must be so carefully and evenly worked that it will come to a smooth surface when laid without planing or scraping.

492. All flooring to be laid close and secret-nailed to the wood strips, end joints to occur only at nailing. All butt joints to be fitted close and even. No flooring to be laid until all finish and base are in place, and all flooring is to be cut out between base so as to make a perfect joint, as no shoe molding will be allowed under any circumstances. Floor to be continuous in all cases under wood thresholds.

493. The surface of flooring to be protected from stains, grit, etc., until completion of building, when the surface is to be scraped smooth, without removing more surface than absolutely necessary.

Painting.

494. Before laying, all flooring is to be thoroughly coated on the underside with paint as specified for outside woodwork.

Wood Thresholds.

495. Quartered white-oak thresholds 4 by 1½ inches, with edges beveled and rounded, are to be provided, fitted and fastened in place, at all door openings between rooms having wood floors, and between rooms having wood and cement floors.

Character and Kind of Finish.

497. All exterior woodwork not otherwise specified to be white pine. In subbasement there is to be no trim.

498. In basement, first, second, third, and fourth stories the entire wood standing finish is to be quartered white oak of even color.

499. None of the windows throughout the buildings are to have any wood trim except an inside casing of frame and a molding to cover joint with plaster.

Quality and Kind of Wood.

500. Quartered white oak to be carefully selected, of bright, even color, with broad and pronounced markings.

501. White pine to be clear and free from sap and injurious defects.

502. Yellow pine to be No. 1 long leaf Georgia heart.

503. All wood finish to be well seasoned, free from injurious defects, and subject to rejection by the supervising engineer if found to be inferior, of unsatisfactory grain or color, or if damaged in any way. Samples of all woods to be submitted as provided under "Samples," paragraphs 69 to 73.

Workmanship.

504. All joinery finish to be put up by nailing in quirks or concealed spaces (not chip nailed), and when such construction is not possible, with screws through the base, and in no case are wood plugs to be used for securing finish.

505. All finish to be assembled as much as possible at the mill, and to be securely glued and doweled.

Back Painting.

506. All standing finish including frames, baseboards, etc., to have on backs and unexposed (when in place) surfaces, two coats of paint as specified for woodwork under "Painting."

Door Frames.

507. Frames for all interior doors to be 3 inches; rebate strips to be ½ inch thick, secured by 1¼-inch round-head brass screws, not over

2 feet apart. Plaster, brick or marble work to return in jamb and joint to be covered with $\frac{3}{4}$ -inch cove molding.

508. Exterior frames to be generally similar and to be 4 inches thick.

509. All frames to be secured to masonry or blocking with nails or screws so placed that heads will be covered by other finish.

510. Frames of all exterior doors and those between rooms and corridors are to have transoms, with solid transom bars rebated for doors and transom sash.

511. All frames are to be brought to the building already put together, finished ready for erection.

Doors.

512. The doors generally are to be 2 inches thick (finished) unless otherwise noted, all to be molded and paneled as indicated, their general character being shown on the drawings.

513. Outside doors to be $2\frac{1}{2}$ inches thick.

514. Glass doors to be glazed as specified under "Glass."

515. All doors, except water-closet and white-pine doors, to be built up of white-pine core strips, not over $\frac{3}{8}$ inch by the thickness of the core and veneered; edge veneer to be about $\frac{1}{2}$ inch thick, meeting stiles of double doors to be beveled and rebated.

516. Water-closet doors to be $1\frac{1}{8}$ inches thick, with raised panels, to be 5 feet high and hung 12 inches from floor.

517. Subbasement and attic doors to be white pine $1\frac{3}{4}$ inches thick.

Trapdoors.

518. Construct trapdoors in attic floor of wings where indicated.

Window Frames.

519. Exterior window sills, pulley stiles, heads, and parting strips, to be yellow pine.

520. Boxed frames for double-hung sash to be $\frac{3}{4}$ -inch clear white pine with $1\frac{3}{8}$ -inch yellow-pine pulley stiles, and to have as long pockets as possible for weights, secured with countersunk brass-head screws. Parting strips to be tightly fitted into grooves, but not fastened; pocket strips separating weights to be No. 20 B. W. G. galvanized iron; inside rebate strip to be $\frac{3}{4}$ inch thick and to match finish of rooms.

521. All double-hung window frames to have axle pulleys for chain, same to have bronze faces, wheels $2\frac{1}{2}$ inches diameter on running face, with special groove, antifriction rollers, and composition axles. Fitting for pulleys to be done at mill, and pulleys to be furnished by mill man from approved samples.

522. Hinged sash to have solid frames of the dimensions, etc., shown (thickness to be not less than $1\frac{3}{4}$ inches, depth to be as required) and rebated full thickness of sash.

523. Skylights will have metal frames as hereinbefore specified.

524. All window frames to be anchored to masonry with heavy pattern holdfasts, spaced not over 3 feet apart.

525. Outside staff beads of exterior window frames to be left loose, and the frames calked tight from both sides with clean oakum before permanently securing these beads in place. This work to be done with special care to avoid injury to the work or jamming of frames.

526. Window frames are to have no trim. They are to have an inside casing and a $\frac{3}{4}$ -inch oak cove molding to cover joint between casing and marble or plaster which returns in jambs.

Sash.

527. All window sash to be 2 inches thick unless otherwise required by the drawings, and all exterior sash to be clear white pine, stained and finished inside to match interior finish.

528. Transom sash to be thickness of doors below, and all transom sash and sash of interior windows to be built up and veneered to match finish. Exterior transoms to be fixed or hinged, interior transoms to be generally hinged at bottom.

529. Sash unmarked on drawings are to be generally double hung, and are to have beveled top, bottom and meeting rails. Bottom rails in exterior sash to be undercut for drip; sash marked "P" are to be pivoted, "C" casement, "S" stationary.

530. All sash to be unwarped, carefully fitted, mortised, wedged, glued, and pinned.

Trim.

531. Doors and windows throughout are to be without any wood trim.

Baseboards.

532. There is to be no wood baseboard in subbasement.

533. All rooms, closets, etc., in basement, first, second, third, and fourth stories not specified to have other baseboard or wainscot, to have a wood baseboard, same to be a $\frac{7}{8}$ -inch board and top molding, finishing 9 inches high; closets to be the same finishing 8 inches high. Baseboards to extend in all cases to top of sleepers under wood floors.

Diffusing Sash.

534. Diffusing sash over staircases to be molded and paneled as shown, and finished in quartered oak.

Hand Rail.

535. Hand rail of main stairways to be selected white oak 3 by 4 inches, molded and carefully shaped. Rails to be secured to core rail by $1\frac{3}{4}$ -inch screws from underside.

Finishing.

536. Certain lumber and joinery work to be painted on backs as hereinbefore specified and all outside woodwork to have a priming coat at mill before being sent to the building.

537. All interior quartered oak standing finish to have a coat of stain and filler and four coats of best varnish. Each coat to be well sandpapered, and last coat to be rubbed down to an egg-shell gloss with pumice stone and oil, finished with a coat of raw linseed oil, wiped with dry cloths until absolutely dry.

538. Finishing to be done by this contractor and completed as nearly as possible at the mill, and the quartered-oak work when set in place to be equal to the very best cabinet finish.

539. The supervising engineer and his representatives shall at all times be permitted to fully and freely inspect the work, and during the progress of its manufacture, and the supervising engineer is to be notified when work is ready for inspection and before any priming, filling or staining has been done.

540. The varnish and oil used in the finishing are to be absolutely pure and at all times subject to inspection.

Hardware.

541. This contractor shall put on all hardware specified herein, including pulleys.



PAINTING AND GLAZING.

Putty.

542. All putty stopping to be neatly done after priming and before the next coat of paint is put on, in the best manner, using the best putty.

Exterior Woodwork.

543. Outside woodwork to have four coats best quality of pure linseed oil and white-lead paint in addition to priming coat put on at mill.

544. Pulley stiles, heads, and parting strips of double-hung window frames to have three coats of best hard-oil finish.

Exterior Metal Work.

545. All exposed exterior iron and metal work (except lead, copper, brass, japanned, galvanized and electro-bronzed work) to have four coats of same paint in addition to priming already on.

Interior Woodwork and Metal Work.

546. All exposed interior woodwork not otherwise specified, iron and metal work (except brass, bronze, japanned, galvanized, and electro-bronze work) to have three coats of paint in addition to that already on, unless particularly specified to the contrary.

Walls and Ceilings.

547. All plastered walls and ceilings throughout the building to be enamel-finished with an approved enamel paint. Finish to consist of at least four coats—two foundation coats, and two finishing coats. Brand of paint to be approved by the supervising engineer in advance of use.

Plumbing Pipes.

548. All exposed plumbing pipes in toilet rooms not nickel-plated and in other rooms where shown, to be painted with enamel paint as above specified.

Lettering.

549. All doors from corridors to be numbered and lettered with title of room or occupant. Letters and figures to be 3 inches high, done in gold shaded with black.

Delivery of Paint.

550. All paints, colors, oil, etc., to be delivered in unbroken packages; paints to be mixed on the premises (except in case of enamel

paint), and all to be subject to inspection. Rejected material to be immediately removed from the premises.

Alternate.

551. Give separate price for omitting painting of plastered walls and ceilings.

Kind and Quality of Glass.

552. Plate glass to be clear, polished, $\frac{1}{4}$ inch thick, without waves or other defects. Chipped or frosted plate to be same quality.

553. All glass to be true and out of wind and lie flat in place without being sprung or bent, and to be left clean and perfect on completion of the work.

554. Glass in exterior windows and doors, including transoms over same, to be bedded in putty, secured with glaziers' points and firmly back-puttied.

555. All other glass to be secured with wood glazing beads fastened in place with round-head brass screws spaced 6 inches apart, but using at least two screws to each length of bead.

Windows.

556. All outside windows to be filled with clear plate glass, except windows Nos. 23, 25, 125, 225, and 325 of each building, which will be chipped plate glass.

557. Interior windows between toilet rooms and staircase halls to have chipped plate glass.

Doors.

558. All outside and vestibule doors and transoms, and side lights, and all other doors so marked, to have clear plate glass.

559. Unless otherwise noted, glass for glass doors to extend from stile to stile and from lock rail to top rail.

560. All toilet-room doors and all doors between rooms and corridors, together with their transoms, also diffusing sash over staircases, to have chipped plate glass.

PLUMBING.

General.

561. The contractor is to provide all the materials, tools, etc., and to perform all labor necessary to place complete in the buildings, all the plumbing required by the drawings and specifications, in strict accordance therewith and to include all permits for sewer connections.

562. All the plumbing materials to be best quality; the brass work, stops, wastes, etc., and all fixtures, to be substantial goods in weight and finish and of well-known, high-grade manufacture, and all to be approved by samples.

563. The work to be done in the most practical and workmanlike manner and must be in every way up to the highest standard of modern sanitary requirements and workmanship.

564. The rules and regulations of the District authorities regarding connections to street sewers must be fully complied with and all fees and charges to be paid by the contractor, and this part of the work must have the approval of the proper local inspector or officials.

565. Proper protection to be provided at the street trenches, walks to be provided and lights maintained, as hereinbefore specified. (See "Risks, blame, etc.," paragraphs 64-67.)

566. On the completion of the work the plumber must lay out distinctly and accurately upon the plans the runs and sizes of the water-supply pipes of each floor where differences occur, returning the plans, properly certified by him, to the supervising engineer for filing with the Department.

List of Fixtures, etc.

567. The bidders are required to give on the proposal sheet list of fixtures called for below by manufacturers and catalogue name or number; in the case of water-closets, flushing valves, urinals, lavatories and slop sinks, three makes of each are to be named, and one make of all other fixtures or appliances. The selection and approval of fixtures to be used will be made at the time of award of the contract. In the event the successful bidder fails to give complete list in his proposal or those named do not comply with the specification requirements, or are in any way unsatisfactory to the Department, or are not best quality and type, then the Department will select the fixtures that are to be used and this selection will be final and binding upon the contractor, subject, however, to the final approval of fixtures by sample, as hereinafter called for.

In everything that affects durability, efficiency, and convenience in use, all plumbing fixtures and fittings must be the very best of their kind, as to materials and workmanship. Fancy designs are not wanted. Bidders may submit three lists, as herein provided; in case the same fixtures in their separate lists differ in price, they may provide for it in the place indicated in the proposal sheet. The three lists must be marked "A," "B," and "C." The "A" list will go with the lump bid as submitted; the alternates will apply to lists "B" and "C."

Water-closets.
 Water-closet flushing valves.
 Urinals.
 Urinal flushing valves.
 Lavatories.
 Lavatory faucets.
 Lavatory traps.
 Slop sinks.
 Slop-sink flushing valves.
 Slop-sink trap standards.
 Slop-sink combination faucets.
 Fire-hose racks.
 Gate valves.

Samples.

568. As soon as possible after the award of the contract the contractor must, at his own expense, submit to the Department for the approval of the supervising engineer, in perfect condition, samples of the following-named fixtures, etc., which he proposes to furnish:

One water-closet complete, with flushing valve and quartered-oak seat.
 One urinal complete, with flushing valve.
 One slop sink complete, with trap standards, combination faucet, and flushing valve.
 One lavatory.
 One lavatory trap.
 One lavatory faucet.
 One 1 $\frac{1}{4}$ -inch-diameter brass gate valve.
 One $\frac{3}{4}$ -inch-diameter finished-brass, nickel-plated gate valve.
 One 3-inch gate valve with iron body.
 One fire-hose rack.
 One sample of fire hose.
 One sample of cold-water pipe covering with band.
 One sample of hot-water pipe covering.

If possible, the samples are to be delivered at one time.

569. Samples, after being approved, will be retained at the office of the superintendent, to be used as a guide in the prosecution and acceptance of the work and may themselves be used in the work if in good condition at the time they are required.

570. No fixture, etc., of the kind named in the above lists is to be delivered at the building until the make or the sample of the same has been approved as above provided.

571. In the selection of the fixtures preference will be given to utility and excellence of manufacture rather than to external appearances.

Cast-iron Pipe.

572. All pipes below grade, unless otherwise specified, including main service connections and drains to dry wells to be of extra-heavy cast-iron hub and spigot pipe of the following average weight per linear foot:

4-inch-diameter pipe to weigh 13 pounds.

5-inch-diameter pipe to weigh 17 pounds.

6-inch-diameter pipe to weigh 20 pounds.

8-inch-diameter pipe to weigh $33\frac{1}{2}$ pounds.

10-inch-diameter pipe to weigh 45 pounds.

573. All fittings for cast-iron pipe to be of corresponding quality and weight.

574. Cast-iron pipe must be straight, cylindrical in bore, of even thickness, spigot end provided with bead, and hub end must be perfect so that satisfactory joints of even thickness can be made.

575. All connections and turns where possible must be made with Y fittings and one-eighth or one-sixteenth bends.

Wrought-iron or Mild-steel Pipe.

576. All water, soil, waste, vent, and down pipes (except where otherwise specified) to be best quality galvanized wrought-iron or mild-steel screw-jointed pipe of standard weight and thickness. Pipe $1\frac{1}{4}$ inches and under to be proved to 150 pounds and pipe $1\frac{1}{2}$ inches and over to be proved to 500 pounds hydrostatic pressure.

577. Connections from area cesspools on north front of laboratories to be 3 inches diameter of extra-heavy galvanized wrought-iron or mild-steel pipe with corresponding weight fittings.

578. Fittings for wrought-iron soil and waste piping must be heavy pattern, galvanized, cast iron, recessed and beaded, screw-jointed drainage fittings: long turn bends must be used for changes in direction of runs, and regular pattern Y branches or long turn T pattern Y branches must be used for all branches. The fittings for wrought-iron or steel water and vent piping must be heavy pattern galvanized, cast, or malleable iron screw-jointed fittings.

579. The inside of all pipes and fittings must be smooth and any burr formed in cutting the pipe or threads must be carefully reamed out.

Lead-lined Wrought-iron or Steel Pipe.

580. In each of the two laboratories 25 waste-pipe stacks, 4 inches diameter, are to be installed where indicated on the plans by W. P.

581. These stacks to be of best quality lead-lined, galvanized wrought-iron or steel pipe and fittings, having lead lining of uniform thickness throughout. Special care must be taken in installing this pipe to insure a smooth inner surface with lining in perfect condition at joints.

582. A **P** trap and a **T** fitting, with a 4-inch-diameter brass screw-jointed clean-out plug, is to be placed at the base of each stack and a 4-inch plugged outlet with brass screw plug is to be left in each story just below ceiling line; face of plug to be on line with finished plaster line.

583. Stacks are to be connected with the horizontal drain lines in subbasement and to be extended as vent pipes above roof.

Brass Pipe.

584. All pipe 2 inches diameter and under exposed in toilet rooms, except pipes running near ceilings, to be finished brass, nickel-plated. Brass pipe must be annealed seamless drawn tubing of standard wrought-iron pipe gauge thickness for all water piping, not less than No. 19 United States standard gauge thick for all waste and flush piping, and not less than No. 16 United States standard gauge thick for all pipe bracing.

585. Fittings for brass pipe to be finished brass, malleable-iron pattern, heavily nickel-plated.

Sewer Connections.

586. A 10-inch connection is to be made from each laboratory building to the 2 by 3 foot brick sewer located just inside of north curb line on B street SW., as shown by drawings.

587. The sewer trenches must remain open until the pipes have been satisfactorily tested and inspected; and defects that may be found are to be made good by the contractor. After inspection by the supervising engineer and District inspector, the trenches must be carefully and thoroughly filled, ramming the earth solid and compact, in 6-inch layers.

Soil and Drain Piping.

588. The soil and waste piping of toilet rooms to be run of sizes noted and as indicated on detail plan sheet 274-54, pipes exposed at ceilings.

589. The soil, waste, and rain-water conductors are to be connected in subbasement to the horizontal lines running near ceiling along outside walls or below floor as indicated, uniting in wings into the one 10-inch connection to sewer from each building.

590. All runs of soil, waste, and drain pipes must be made in direct lines and grades as indicated and noted on plans, and where the grades are not marked the pipes must be given as sharp fall as possible.

591. Drains from the cesspools at cold-air inlets and in cold-air chambers to be run as indicated on the plan to the two dry wells located where shown.

592. Y fittings with brass screw clean-out plugs the full size of pipe are to be placed on the piping in subbasement where indicated.

593. At the base of each down spout and soil pipe a T fitting with a brass screw clean-out plug the full size of pipe is to be provided and installed. P traps to be provided below these fittings on all down spouts.

594. Waste connections from the various fixtures to be of the following sizes: Water-closets, 4 inches; slop sinks, 3 inches; urinals, 2 inches; two-basin lavatories, $1\frac{1}{2}$ inches; connection to each lavatory basin $1\frac{1}{4}$ inches.

Vent Pipes.

595. The soil, vent, and waste pipes are to be extended 2 feet above the roof line and thoroughly flashed to roofing with 6-pound lead.

596. Dead-end vents from the lavatories where required are to be run over and connected to the main vent stacks as indicated on the plans. No connections to vent stacks to be made below the fixtures.

Jointing and Connections.

597. All joints of cast-iron pipe and of wrought-iron or steel pipe to cast-iron pipe to be made with best quality oakum and best quality and brand of soft pig lead, made in an approved manner.

598. Connections between wrought-iron or steel pipe to be screw joints, made of red lead and boiled linseed oil.

599. Brass piping to have brass union connections where required.

Traps.

600. A 10-inch-diameter "extra heavy" cast-iron running trap must be placed on the main sewer connection from each building. Traps to be placed in subbasement at points where mains leave buildings, outside of all connections, having clean-out plugs at floor line. A 6-inch-diameter fresh-air inlet is to be provided for each trap, air inlet connection to be carried through wall and to terminate at outside face with a perforated cap.

601. The waste from each plumbing fixture must have a trap with deep water seal. Traps of water-closets and urinals are to be molded

in the earthenware or fixtures and traps for lavatories and slop-sink standards are to be approved pattern, nickel-plated, cast brass, non-siphoning, and self-cleaning, and must be without ball float or other movable parts.

602. All soil and waste lines being vented, separate vent connections will not be required on the individual traps.

603. A **P** trap is to be provided on each area drain connection, placed directly below each cesspool.

Area Cesspools.

604. Cast-iron deep-bell trap cesspools with hinge covers and 3-inch outlets, unless otherwise specified, are to be provided and set at required grades in areas where shown on plan. Connections from cesspools to be made to sewerage system or dry well as hereinbefore specified.

Water Supply.

605. A 3-inch rising main and a 3-inch falling main is to be provided in the two vent shafts adjacent to toilet rooms as indicated, running from subbasement to attic.

606. The rising mains are to discharge over top of tanks, the supply to each tank being controlled automatically by three 1½-inch approved float valves with ample size copper ball floats. A gate valve is to be placed on the 3-inch rising main near tank and also on each of the 1½-inch branches to the float valves.

607. The falling mains are to be connected near bottom of tanks, to be valved close to tanks, having a valved cross connection outside of tank valves so that both falling mains can be supplied from either tank, and to be provided with outlets in the various stories to supply the toilet-room fixtures.

608. The falling and rising mains in each shaft are to be connected in subbasement with a valve on each inside of connection, so that rising mains can be cut off and falling mains be used for supplying fixtures direct from mains in subbasement. The one 3-inch connection at each shaft to be brought out of shaft and capped in corridor space for future connections, the subbasement mains not being included in this contract.

609. A 4-inch overflow and a 2-inch valved drain connection to each tank and a 2-inch connection to each drip pan to be connected to one 4-inch line, which is to run over in attic and to be carried down to discharge into roof gutter near each tank.

610. A ¾-inch telltale pipe is to be connected to the 4-inch overflow near each tank and run down adjacent shaft, terminating in corridor subbasement for future connections.

611. A 2-inch connection is to be made to the falling main for the supply of each separate toilet room.

612. Connections to the fixtures to be of the following sizes:

For each water-closet flush valve $1\frac{1}{4}$ -inch direct from a 2-inch main.

For each urinal flush valve 1-inch from a $1\frac{1}{2}$ -inch branch.

For each slop-sink flush valve $1\frac{1}{4}$ -inch from a $1\frac{1}{2}$ -inch branch.

For lavatories $\frac{3}{4}$ inch; $\frac{1}{2}$ inch to each faucet.

613. A drain connection with gate valve and hose nipple is to be provided at the base of each rising and falling main.

Hot-water Piping.

614. A $1\frac{1}{2}$ -inch hot-water supply pipe is to be run up full size in each of the two vent shafts adjacent to toilet rooms in each building to a point 6 feet above the fixtures of fourth story and capped water and air tight.

615. A circulating pipe 1 inch diameter is to be connected to each riser just below highest fixture and run down to subbasement.

616. The $1\frac{1}{2}$ -inch supply risers and 1-inch circulating pipes are to terminate in corridor of subbasement near ceiling just outside of shafts.

617. Drain connections as above specified for cold-water pipes to be provided at the base of these risers.

618. Hot-water connections, $\frac{3}{4}$ inch diameter, to be made to risers and run to each lavatory and to each slop sink. Connection to each lavatory basin to be $\frac{1}{2}$ inch diameter.

Fire-hose Service.

619. Two 3-inch-diameter fire risers are to be run in the shafts of each building where shown on the plans, having at each story including basement, about 6 feet above the floor line, a $1\frac{1}{2}$ -inch outlet for hose connection.

620. The risers are to terminate in corridors of subbasement just outside of the shafts, where a shut-off valve is to be placed, and are to be extended 6 feet above highest connection, that is, fourth-story connection, and capped water and air tight.

621. Each outlet is to have a $1\frac{1}{2}$ -inch-diameter heavy pattern brass nickel-plated angle valve with hose nipple and an approved nickel-plated brass swinging hose rack arranged to hold the hose in vertical loops.

622. Hose racks must be supported by clamp around hose nipples.

623. Each rack must be provided with 150 feet of $1\frac{1}{2}$ -inch-diameter best quality unlined linen hose, properly treated to prevent mildew and tested to 200 pounds per square inch, and each hose must have couplings and nozzle complete, heavy pattern, finished brass, nickel-plated.

Pipe Sleeves.

624. Where pipes pass through walls, pipe sleeves generally two sizes larger than the pipes to pass through same are to be provided. Sleeves to be in length equal to the thickness of the walls and walls around sleeves must be put in good condition.

Hangers and Supports.

625. Pipes run near ceilings must be supported with approved adjustable hangers, spaced not over 10 feet apart; vertical lines of pipes must be supported with approved wrought-iron or steel bands bolted around same and secured to floor framing, or must be built into the construction, as required.

626. All hangers and supports must be of size and width proportional to weight of pipe to be supported.

627. No chain or wire hangers will be allowed.

Tests for Piping.

628. The various stacks and sections of soil, waste, and vent pipes placed under this contract must be tested by filling with water before the fixtures and connections made to street sewer are connected; all necessary openings are to be temporarily plugged or capped, and the piping filled with water and allowed to stand six hours for inspection, when, if proved tight, the water is to be drawn off, the temporary plugs removed and fixtures connected.

629. If for any reason the above tests be considered inadvisable or insufficient, the supervising engineer may direct that the system be subjected to an air-pressure test of 3 pounds per square inch.

630. The entire system of water piping in building must be tested by a hydrostatic pressure of 100 pounds per square inch.

631. Testing and proving of all work must be satisfactory to the supervising engineer.

632. After the fixtures have been connected, the smoke test is to be applied as directed by the supervising engineer.

House Tanks.

633. Two supply tanks for each building are to be located where shown on plans in attic. Tanks to be 12 feet long, 5 feet wide, and 6 feet high. They are to be constructed of best quality homogeneous boiler steel $\frac{5}{16}$ inch thick, joints made with $\frac{5}{8}$ -inch-diameter rivets, spaced $1\frac{7}{8}$ inches on centers and all joints calked water-tight. Tanks to be reenforced and braced by proper angle irons in the most approved manner, and drawings in triplicate of same to be furnished the supervising engineer for approval before the work is proceeded with.

634. The tanks to set in a drip pan of homogeneous boiler steel $\frac{1}{4}$ inch thick, extending 6 inches beyond tanks and 5 inches deep;

the drip pans to rest on 4 by 6 inch yellow-pine sleepers 16 inches on centers placed between bottom of drip pan and floor. The yellow-pine sleepers are to be furnished and set by carpenters.

635. Each tank to have a cover made of 3 by 4 inch yellow-pine frame with galvanized-iron heavy wire grating $\frac{1}{4}$ -inch mesh and manhole openings in same, hinged.

636. Tanks and drip pans to be painted with three coats metallic paint inside and outside.

637. Connections to tanks to be made as hereinbefore specified; openings for pipe connections in tank and pans must be reenforced with flanges securely riveted on.

Valves.

638. All valves to be double-seat gate valves of approved and first-class construction, of extra-heavy pattern.

639. Valves 2 inches and under to be of brass; all over this size to be of iron with brass mountings. Valves on nickel-plated piping to be finished brass nickel-plated.

640. All valves to be placed in accessible positions and each to have the name or trade-mark of the manufacturer cast or stamped on same.

641. Valves are to be placed on the mains and tank connections as hereinbefore specified, on each main branch hot and cold water supply pipe to each toilet room, and on each individual branch connection to each fixture, including connections to water-closets, urinal, and slop-sink flush valves.

Flushing Valves.

642. Each urinal, water-closet, and slop sink must be fitted with an approved finished brass, nickel-plated flushing valve with heavy operating lever and handle or push button operating device. Handles of flushing valves must be permanently fastened to the operating levers if this type of operating device is used.

643. Each flushing valve must have a regulating device to adjust the amount of flush water and give proper refill to the fixture.

644. Inlet connections for flushing valves must not be less than $1\frac{1}{4}$ inches in diameter for water-closet and slop sinks and not less than 1 inch in diameter for urinals.

645. A finished brass, nickel-plated, ground-joint union must be provided in the connection between cut-off valves and each flushing valve.

Pipe Covering.

646. After the cold and hot water piping herein specified has been installed, tested and approved, this contractor must cover same, the

piping in toilet rooms being excepted, with first-class approved non-conducting sectional felt covering, canvas-jacketed, put on in a workmanlike manner, using solid-brass bands of not less than No. 32 B. & S. gauge or less than $\frac{3}{4}$ inch wide, and special coverings for valves and fittings.

647. Coverings to be not less than $\frac{5}{8}$ inch thick, lined with tar paper for cold-water piping, and not less than 1 inch thick for hot-water piping lined with asbestos paper.

648. After the coverings have been applied and accepted they are to be painted with two coats of best quality lead and oil paint, finishing tints to be approved. Brass bands to be removed while covering is being painted and replaced after paint is dry.

Fixtures.

649. Provide and set the following fixtures for each building:

	Water-closets.	Urinals.	Lavatories.	Slop sinks.
Basement	9	4	3	2
First floor	9	4	3	2
Second floor	9	4	3	2
Third floor	9	4	3	2
Fourth floor	9	4	3	2
Total	45	20	15	10

Water-closets.

650. Earthenware water-closets, large-size, with plain white finish, must be furnished, set and connected where indicated on the drawings. Each closet must be of heavy vitreous Class A earthenware with strong, substantial, pedestal base and floor flanges and trap and bowl molded in one piece, and must have the pottery vitreous stamp under the glaze.

651. Satisfactory evidence must be furnished showing that the pottery is of a well-known, high-grade manufacture, which has stood the test of use in important work.

652. Closets must have large flushing rims with ample perforation properly distributed.

653. Soil passage in closets must be of ample dimension and free from burrs or pockets.

654. Closets to be of siphon-jet pattern of first-class construction and free from defects as to material or workmanship, and must be designed with deep seals, and to retain a large body of water in bowls.

655. The water-closet connections are to be made with heavy pattern, screw-jointed, brass floor flanges and 4-inch-diameter wrought-iron nipples of proper length screwed to wrought-iron soil-pipe

fittings; brass floor flanges with male thread may be used in lieu of above.

656. Closets to be bolted to the brass floor flanges with brass bolts; exposed heads of nuts of bolts to be nickel-plated.

657. Joints between closets and floor flanges to be made absolutely water and gas tight with special molded gaskets.

658. Approved screw-joint connections may be made between water-closets and soil pipes in lieu of connections above specified if so desired by contractor.

659. The wood seats of all closets must be strongly framed, not less than $1\frac{1}{4}$ inches thick when finished, and reenforced with finished-brass nickel-plated straps containing rubber buffers secured to underside of seats with screws. Seats to all closets must be well seasoned, quarter-sawed, clear, selected eastern white oak.

660. All seats for closets must be cabinet finish and must be directly attached to flanges or lugs on closet bowls with heavy finished brass nickel-plated hinges, secured to bowls and seats in an approved and substantial manner so as to prevent any shifting or side play of seats.

661. No covers will be required for water-closet seats.

662. Each closet must be fitted with a flushing valve, as hereinbefore specified.

Urinals.

663. The urinals must be of plain white finish vitreous earthenware as specified for closets, of large size lipped pattern and have flushing rims. Urinal bowls to be of the siphon-jet pattern and designed to hold a body of water in the bowl.

664. Backs of urinals must be ground down to a true surface to fit tight against the marble backs.

665. Each urinal bowl must have a 2-inch-diameter waste connection and must be fitted with a flushing valve as hereinbefore specified.

666. All exposed metal connections of urinals must be finished brass, nickel-plated.

Slop Sinks.

667. Slop sinks to be not less than 18 by 22 by 12 inches deep, of best grade, heavy, plain white vitreous porcelain, glazed inside and outside and fitted with finished brass, nickel-plated flushing rims.

668. Sinks to have brass strainer in the waste and to be provided with a 3-inch cast-brass, nickel-plated, nonsiphoning trap standard without vent.

669. Standards to have large flange or spider to fit bottom of sink for supporting same.

670. Connections to waste pipes to be made similar to the connections specified for water-closets.

671. Hot and cold water connections to be provided for each sink, which are to be fitted with approved combination faucets and with a direct cold-water connection to flushing rim, fitted with a $1\frac{1}{4}$ -inch flushing valve, connections to be secured to marble wainscot with clamps and expansion bolts. All fittings to be finished brass, nickel-plated.

Lavatories.

672. All lavatories shown on plans to be one-piece, two-basin, best quality, heavy pattern vitreous Class A porcelain, with porcelain legs and with galvanized-iron wall supports, securely fastened with expansion bolts.

673. Basins to be oval in shape, not less than 16 by 12 inches inside dimensions, and lavatory to be approximately 4 feet long by 2 feet wide over all dimensions.

674. Each lavatory to have an approved finished cast-brass, nickel-plated, nonsiphoning trap; one trap only being required for each two-basin lavatory.

675. Approved plain, heavy pattern "Fuller" hot and cold water faucets, with ground-joint unions in bodies, must be provided for each basin; each hot and cold water supply connection to lavatory basin must be provided with an air chamber under the lavatory.

676. Each basin to have a soap holder and chain stay set opposite the center of basin with No. 3 nickel-plated safety chain and rubber plug.

677. A towel rack is to be provided for each lavatory, to be placed back of lavatory on wainscot, to be in length equal to the length of lavatory, to be constructed of $\frac{3}{4}$ -inch-diameter brass tubing with ornamental caps at ends, and supported about 3 inches from walls with heavy-pattern brass brackets, securely fastened in place.

678. All metal fittings, unless otherwise specified, and connections of lavatories to be finished brass, heavily nickel-plated.

Marble.

679. All plumbing marble to be furnished by contractor for marble work, and plumber is to furnish accurate information for the location of all cutting, etc.

Temporary Plumbing.

680. Bidders will note that certain temporary plumbing as described by paragraphs 85 to 88 is to be done.

681. Proper separation of these items should be made in estimating.

HARDWARE.

General.

682. All hardware necessary to complete the work and trim every door, window, transom, etc., must be furnished and put in place whether specifically mentioned or not, and except where otherwise specified, is to be of solid bronze, heavy pattern, and plain finish.

683. Hardware in connection with door and window grilles, etc., has been specified and included with that work.

Weight of Butts.

684. Butts to weigh as follows:

- 3 by 3 inch butts, 1 pound 5 ounces per pair.
- $3\frac{1}{2}$ by $3\frac{1}{2}$ inch butts, 1 pound 15 ounces per pair.
- $4\frac{1}{2}$ by $4\frac{1}{2}$ inch butts, 3 pounds 12 ounces per pair.
- 5 by 5 inch butts, 4 pounds 5 ounces per pair.
- $5\frac{1}{2}$ by $5\frac{1}{2}$ inch butts, 5 pounds 8 ounces per pair.
- 5 by 6 inch butts, 5 pounds 5 ounces per pair.
- 5 by 7 inch butts, 7 pounds 7 ounces per pair.
- 6 by 6 inch butts, 6 pounds 6 ounces per pair.

685. All butts to have five knuckles and loose pin, steel-bushed, self-lubricating, with ball tips, unless otherwise noted.

686. Hardware throughout to be of heavy pattern and acceptable in all respects to the supervising engineer.

Doors.

687. Locks and latches, unless otherwise noted, to be mortise, and all parts except case and springs to be bronze; spiral springs to be of best composition metal, flat springs to be of steel, cases to be of bronzed or japanned iron and the tumblers of all locks must differ so that each lock can be opened only by the keys belonging to it, unless otherwise particularly noted. Locks for double doors to have rebated face unless they are otherwise particularly noted.

688. Basement outside doors to have three $5\frac{1}{2}$ by $5\frac{1}{2}$ inch butts to each door. Each to have cylinder mortise lock, case $7\frac{1}{2}$ by $3\frac{1}{4}$ inches, flat round cast-bronze $2\frac{3}{4}$ -inch knobs for both inside and outside, escutcheon plates to be 11 by $3\frac{1}{2}$ inches. Each leaf to have mortise lever flush bolt, top and bottom, of proper length.

689. All doors on corridors and all interior passage and communicating doors to have three 5 by 7 inch butts. All, not otherwise noted, to have mortise locks, brass face, three tumblers, case $4\frac{1}{2}$ by $3\frac{1}{2}$ inches, cast-bronze $2\frac{1}{2}$ -inch knobs, cast-bronze escutcheon plates 10 by 5 inches. Double doors to have rebated locks of same character and extra-heavy mortise lever top and bottom bolts.

690. Intermediate vestibule doors to have Bardsley checking spring hinges as marked, heavy cast bronze, two to a door and of sufficient size to properly swing same. Each door to have on both sides kick plates of height shown and full width of door, and $\frac{1}{8}$ inch thick. Each door to have also on both sides a push-bar handle from stile to stile of extra-heavy brass tubing $1\frac{1}{4}$ inches (outside) diameter, secured to stiles by heavy brass screws through cast base plates.

691. All doors opening from corridors to have mortise cylinder office-door locks complete, with cast-bronze $2\frac{1}{2}$ -inch knobs and combined escutcheon, $3\frac{1}{2}$ by 11 inches.

692. Double-acting doors in toilet rooms to have approved cast-bronze nickel-plated double-acting hinges for marble, and $3\frac{1}{2}$ by 12 inch beveled push plates on both sides.

693. Closet and pipe shaft doors to have three $4\frac{1}{2}$ by $4\frac{1}{2}$ inch cast-bronze butts, and same locks and knobs as passage doors, with one escutcheon.

694. All doors in attic to have same locks and trim as closets.

Water-closet Doors.

695. All water-closet doors throughout the building, shown to open in, to have heavy box-flanged, single-acting, easy spring hinges for marble, spring to throw doors open. To have also heavy bar latch to bolt through marble hanging stile, to engage keeper fastened on door when closed.

696. Each water-closet compartment to have extra-heavy coat and hat hook 6 inches in height and with 5 inches projection, to fasten to marble partitions by bolting through same and securing with solid cone-shaped nut. The fastening plate to be of triangular shape, approximating 3 inches on each side, and $\frac{1}{4}$ inch in thickness.

697. Provide approved brass nickel-plated rubber-tipped stops for all water-closet doors opening or closing against marble work.

698. All the above water-closet hardware to be solid cast bronze, heavily nickel-plated.

Door Stops.

699. Wood door stops, to match finish, with rubber tips, to be provided for all wood doors where the same can be secured to wood or plaster, and solid bronze wall or floor stops with rubber tips to be furnished for all gates and for all wood doors where stops must be secured to cement, terrazzo, or marble floors or finish.

Transoms.

700. There are to be transoms over all doors in corridors, except 20, 21, 37, 38, and 45, both laboratories, same to be hinged at bottom and to have 4 by 4 inch fast-joint butts and $\frac{3}{8}$ -inch transom lift, class No. 4, of sufficient length to come within 5 feet of floor.

Windows.

701. All double-hung sash to have cast-iron or lead weights, and metal sash chain having a tensile strength of not less than 620 pounds.

702. All double-hung sash to have heavy bronze flush lifts 2 by 3½ inches, and extra-heavy bronze sash locks, cam movement, and all to have cast-bronze pole sockets 1½ inches round.

703. Provide eighteen ash poles with bronze hooks, of sufficient length to operate the windows.

Trapdoors.

704. Trapdoors to attic in wing of each laboratory building to have heavy galvanized strap hinges, and approved chain, weights and pulleys, to manipulate the door.

Paper Holders.

705. Furnish, to be secured to marble or other surface near each water-closet, an approved cast-brass nickel-plated holder for roll paper, so constructed that roll can not be removed from holder until all the paper is unrolled.

Key System.

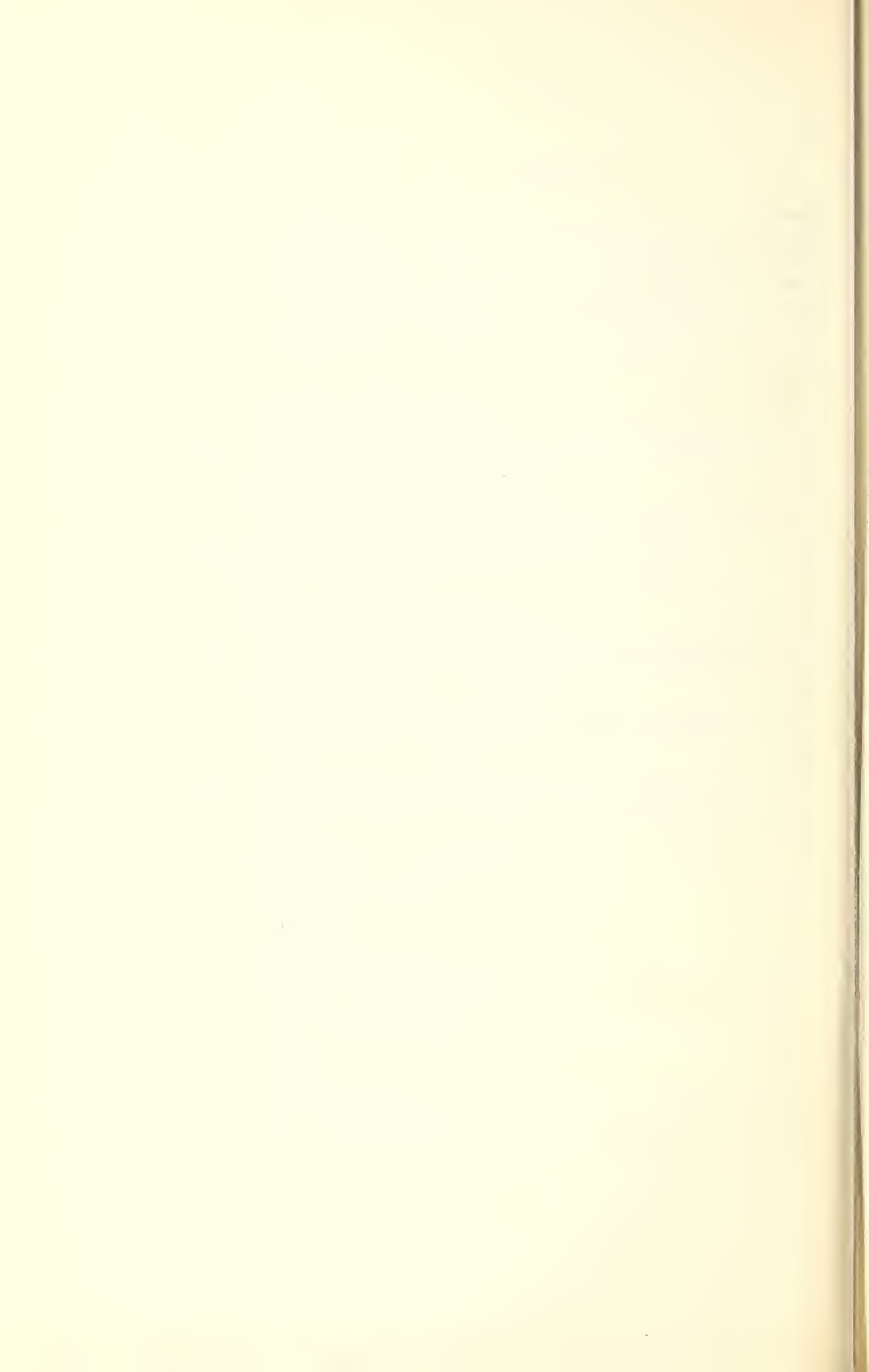
706. All corridor doors to be master-keyed, each floor separately, and furnish six master keys for each floor.

Finish.

707. All finish not otherwise hereinbefore noted, to be plain polished bronze metal. All to be of best quality known to the trade.

Samples.

708. Samples in duplicate of each article of hardware are to be furnished under "Samples."



PROPOSAL SHEETS.

Proposal for the General Construction (except Heating Apparatus, Elevators, Electric Wiring, and Conduits) of two Laboratory Buildings designated as Laboratory A and Laboratory B, for the U. S. Department of Agriculture, Washington, D. C.

BIDDERS WILL NOTE:

After this proposal has been filled out, it must be detached, the sheets fastened together and delivered or forwarded in a sealed cover or envelope which must be distinctly addressed to "Chairman of Building Committee, Department of Agriculture, Washington, D. C.," and plainly marked "Proposal," with the title of the buildings as given above.

Lump sum proposals for the entire work must be submitted in accordance herewith, and no separate proposals for portions of the work will receive consideration, except alternate proposals forming part of each complete proposal as herein required, and the request for such alternates must not be construed as inviting separate proposals for the work included therein.

The various amounts, names of materials, appliances, etc., on the various proposal sheets *must be typewritten*. Bids not containing all information called for may be considered incomplete and not given consideration if so determined by the Department.

Prices for alternates are to include all work and material required or necessarily involved in the change if the same be accepted.

....., 1904.

To the SECRETARY OF AGRICULTURE,
Washington, D. C.

SIR:

.....hereby propose to furnish all the labor and material necessary to complete the entire general construction (except heating apparatus, elevators, electric wiring and conduits), of two laboratories, designated as Laboratory A and Laboratory B, for the United States Department of Agriculture, Washington, D. C., in strict accordance with the specification, the drawings enumerated in

II

paragraph 27 of the said specification, the details, explanations and instructions to be furnished by and through the supervising engineer, Agricultural Department, Washington, D. C., to the satisfaction and subject to the approval of the architects and the supervising engineer, for the respective sums named, as follows:

Lump Bid (A).—Using granite from quarry for
base, and marble fromquarry for
superstructure.

..... (\$.....)

Lump Bid (B).—Using granite from.....quarry
for base, and marble from.....quarry for
superstructure.

..... (\$.....)

Lump Bid (C).—Using granite from.....quarry
for base, and marble from.....quarry for
superstructure.

..... (\$.....)

Lump Bid (D).—Using granite from.....quarry
for base, and granite from.....quarry for
superstructure.

..... (\$.....)

Lump Bid (E).—Using granite from.....quarry
for base, and granite from..... quarry for
superstructure.

..... (\$.....)

III

Lump Bid (F).—Using granite from.....quarry
for base, and granite from.....quarry for
superstructure.

..... (\$.....)

And will agree to complete the entire work within the periods
named below, time to be computed from the date of the formal
contracts:

Lump Bid (A)months.

Lump Bid (B)months.

Lump Bid (C)months.

Lump Bid (D)months.

Lump Bid (E)months.

Lump Bid (F)months.

Alternate (1).

Amount to be added to or deducted from lump sum bids for sub-
stituting terra cotta floor construction in lieu of concrete construc-
tion specified.

Add

..... (\$.....)

Deduct

..... (\$.....)

Alternate (2).

Amount to be added to or deducted from lump sum bids for sub-
stituting a system of floor construction in the form of segmental
brick arch with bricks set flatwise with terra cotta skewbacks in lieu
of concrete construction specified.

Add

..... (\$.....)

Deduct

..... (\$.....)

IV

Alternate (3).

Amount to be added to or deducted from lump sum bids for substituting system of reinforced concrete construction in lieu of steel beam and concrete slab construction specified.

Add.....

..... (\$.....)

Deduct

..... (\$.....)

Alternate (4).

Amount to be added to lump sum bids for substituting solid wrought and cast bronze metal for all door grilles, elevator inclosures, stair railings, etc., in lieu of electro-bronzed iron specified.

Add.....

..... (\$.....)

Alternate (5).

Amount to be added to or deducted from lump sum bids for substituting for the fire escapes specified, those of the Kirker-Bender type.

Add.....

..... (\$.....)

Deduct

..... (\$.....)

Alternate (6).

Amount to be deducted from lump sum bids if entire tile roof be laid as specified, but with plain surface, omitting ribs.

Deduct

..... (\$.....)

V

Alternate (7).

Amount to be added to or deducted from lump sum bids for using
plaster in lieu of that
 specified.

Add.....
 (\$.....)

Deduct
 (\$.....)

Alternate (8).

Amount to be deducted from lump sum bids for the omission of all
 marble wainscoting, marble door and window architraves, and door
 and window jambs in corridors and staircase halls of both labora-
 tories.

Deduct
 (\$.....)

Alternate (9).

Amount to be deducted from lump sum bids for the omission of
 marble stairs of both laboratories.

Deduct
 (\$.....)

Alternate (10).

Amount to be deducted from lump sum bids if the painting of
 plastered walls and ceilings with enamel paint is omitted.

Deduct
 (\$.....)

Alternate (11).

Amount to be deducted from lump sum bids if the entire rear
 wing of Laboratory B be omitted, openings in subbasement to be
 closed with 13-inch brick walls and those above to be filled with
 frames and sash.

Deduct from lump sum bid (A).....
 (\$.....)

VI

Deduct from lump sum bid (B).....

..... (\$.....)

Deduct from lump sum bid (C).....

..... (\$.....)

Deduct from lump sum bid (D).....

..... (\$.....)

Deduct from lump sum bid (E).....

..... (\$.....)

Deduct from lump sum bid (F).....

..... (\$.....)

Amount allowed in lump sum bids for tile roofing.....

..... (\$.....)

Name of roofer it is proposed to have do the work.....

Amount allowed in lump sum bids for plumbing, exclusive of temporary work.

..... (\$.....)

Name of plumber it is proposed to have do the work.....

If list B of plumbing fixtures and fittings be selected, add (or) deduct (\$.....)

If list C of plumbing fixtures and fittings be selected, add (or) deduct (\$.....)

List of Fixtures.

Three makes of water-closets, urinals, lavatories, slop sinks, and flush valves must be named, any one of which may be selected. Only one make need be named for other fixtures.

VII

Water-closets:

- A
- B
- C

Water-closet flushing valves:

- A
- B
- C

Urinals:

- A
- B
- C

Urinal flushing valves:

- A
- B
- C

Lavatories:

- A
- B
- C

Lavatory faucets

Lavatory traps

Slop sinks:

- A
- B
- C

VIII

Slop-sink flushing valves:

A

B

C

Slop-sink trap standards.....

Slop-sink combination faucets.....

Fire-hose racks

Gate valves

UNIT PRICES.

Price for each additional test loading:

..... (\$.....)

Price per linear foot for additional test borings:

..... (\$.....)

Price included in bid for plaster model of face of building:

..... (\$.....)

Price for trench and footing excavation per cubic yard added:

..... (\$.....)

Per cubic yard deducted:

..... (\$.....)

Price for concrete footing per cubic yard added:

..... (\$.....)

Price per cubic yard deducted:

..... (\$.....)

Price per M for additional hard brick laid:

..... (\$.....)

Price per M deducted:

..... (\$.....)

IX

Price per M for additional white face brick laid :

..... (\$.....)

Price per M deducted :

..... (\$.....)

Price per superficial square foot granite ashlar added :

..... (\$.....)

Price per superficial square foot deducted :

..... (\$.....)

Price per superficial square foot granite molded work added :

..... (\$.....)

Price per superficial square foot deducted :

..... (\$.....)

Price per superficial square foot of marble ashlar added :

..... (\$.....)

Price per superficial square foot deducted :

..... (\$.....)

Price per superficial square foot of marble molded work added :

..... (\$.....)

Price per superficial square foot deducted :

..... (\$.....)

Price per pound for steelwork added :

..... (\$.....)

Price per pound for steelwork deducted :

..... (\$.....)

Price per yard for plastering as specified added :

..... (\$.....)

X

Price per yard for plastering as specified deducted :

..... (\$)

Price per yard for special hard plastering, named in alternate (7),

added (\$)

Price per yard for special hard plastering, named in alternate (7).
deducted :

..... (\$)

Price per square foot for interior Italian marble wainscot added :

..... (\$)

Price per square foot deducted :

..... (\$)

Price per square foot for interior "American Pavonazzo" marble
wainscot added :

..... (\$)

Price per square foot deducted :

..... (\$)

Price per square foot for terrazzo floor added :

..... (\$)

Price per square foot deducted :

..... (\$)

Price per square foot for maple flooring added :

..... (\$)

Price per square foot deducted :

..... (\$)

(Signature).....

(Address).....

XI

NAMES OF INDIVIDUAL MEMBERS OF FIRM.

NAME OF CORPORATION.

NAME OF PRESIDENT.

NAME OF SECRETARY.

UNDER WHAT LAW CORPORATION
IS ORGANIZED.



